









## Downtime

by Chad

### Exit, pursued by a theory

THE pull-the-wings-off-the-butterfly people have been at it again, with all this trying to prove by computer that Shakespeare was the author of a hitherto anonymous (and incidentally second rate) play. After the hallyhoo over the authorship of "The Bonke of Sir Thimms Mure" had died down we were left with established scholars accusing the proponents of the new theory of being sloppy and jumping the gun, while the newcomers in turn complained that they were excluded from publication by vested interests.

I have this awful feeling of having been here before. Years ago a friend of mine tried to turn me on to a book that proved beyond a shadow of a doubt that Shakespeare was written by Christopher Marlowe. It did this by measuring the average length of words in various plays to 0.3 decimal places, and comparing them. My friend was most scornful when I remained unconvinced — I must be some ignorant savage still to disbelieve over Unerring Science has spoken.

(The theory did, by the way, allow for the fact that Marlowe died half way through Shakespeare's career. Marlowe's murder was supposed to have been faked to allow him to escape from some enemies, which was not allowed for, was the fact that if you read the plays instead of counting the blasted letters you realise that Marlowe and Shakespeare were totally different people.)

Anyway the Marlowe theory is now discredited, I am told, because the mathematics was unsound in some way or other. But if that is the case, how can simple souls such as you or I be sure that there isn't a slight error in the latest pronouncements? I am sceptical as was Disraeli about "lies, damned lies, and statistics", and I get very worried about these people who say "The

significance level of my figures proves the following is true about the world. . . . This gets very dodgy over such contentious issues as the efficacy of comprehensive schools.

The present theory is based on the work of the Rev Andrew Morton, who has explained his ideas in detail in an article in Computer Weekly (CW, August 9, 1979). The analysis uses the "word habit" of writers, that is, how often they use certain combinations of words and certain other words to start sentences. Morton is used to holding regarded as a crank by traditional academics, but he gets very browned off at those who say, "If you can show your method works with (say) Dickens, I'll believe you." Morton then shows it does work, and lo and behold the academics find another reason not to accept it.

It was Thomas Merriam, an historian at Basingstoke Technical College, who did the work on "Sir Thomas More". He agrees that some of his samples may be too small, but insists that he still gets plenty of reliable results. In the meantime he is having difficulty getting his work published so that people can judge it on its merits.

Stanley Wells of the Oxford University Press points out other difficulties, such as the fact that if you read the plays instead of counting the blasted letters you realise that Marlowe and Shakespeare were totally different people.)

Also, how can you analyse the first words of sentences when Shakespeare never wrote any punctuation? The full stops were put in by the printers.

Wells concludes by saying, "Lots of literary scholars are suspicious of computers." Now that can't be a bad thing.

## MICHIE'S PRIVATEVIEW

COMPUTER people engaged in hurrying up the tree of knowledge will have been more than a little dumbfounded by the view taken of computer-stored information by three Appeal judges in the case of the Crown versus Pettigrew, accused of stealing banknotes. Three fivers in his possession had serial numbers matching a list printed out by the Bank of England computer. To be admissible, according to the 1965 Criminal Evidence Act, a document must be prepared by someone with knowledge of its contents. A computer cannot be regarded, so the Appeal Court ruled, as having "knowledge" in this sense.

Something, either in the state of the law or in received notions of what constitutes knowledge, must be very seriously wrong. Yet Examining Boards down the ages have made no bones about knowledge. If the candidate can correctly retrieve the requested information, then he is credited with knowledge of it, and hence with knowledge of the contents of any document he prepares in his attempt to satisfy the examiners. Why the Bank of England computer's print-out should be flunked in the analogous case seems mysterious.

Doubtless the computer itself generated in the first place the numbers which it subsequently knew, or did not know. But in the examination room this is never a disqualifier.

I recall Practical Electricity in my Physics Prelims. I had concluded by prior study of statistical distributions that the chance of having an electricity experiment was small. In horror I saw the words, "Use the apparatus provided to verify Ohm's Law." What Law? And how on earth was this contraption to be wired up, let alone used?

### Don't bank on knowing how to define knowledge . . .

First hurdle: announce that the apparatus supplied is unusable. In relative terms and taking all things into account it certainly was. The investigator finally sorted it out, taking and recording in the process a great number of trial readings. So the second hurdle was a gift. Ohm's Law shone from the jottings so seductively that only an unfeeling dolt could have failed to note, and duly verify, the beautiful regularity.

I thus received a satisfactory mark for my knowledge of Practical Electricity. So what is all this nonsense about the Bank of England's machine, even if a little computer creativity may have been involved somewhere along the line?

Before any reader chokes on the word "creativity", let me at once affirm that information cannot be created in the course of a computation although, alas, it can only too easily be destroyed. Does this mean that a computer cannot, through purely internal operations, add to its knowledge? If we continue to guide our definitions by Examining Board practice, it means nothing of the kind. It is the capacity to give correct

answers to questions: clear enough, one would think.

Clear enough with computers. For human knowledge-sources the matter can get tangled. The outraged husband, finding a nude man in his wife's bedroom wardrobe barks at the intruder: "What the hell are you doing there?" "Everyone," comes the reply, "has got to be somewhere." Does this rate 10 out of 10, or 0 out of 10? Certainly any intermediate mark would seem to be wrong.

But how can a computer add to its knowledge without adding to its information? Suppose I load a prime factorisation program which, for integers up to a million, answers "Yes" or "No" according as the number concerned is composite or prime. I try it with 997 and after a while (this is a slow home computer) I get "No." So its "knowledge" extends at least to 997. What else does it know?

After input of 999,997 I get bored and go out, leaving it running. No marks out of ten. My program habitually enters its computed results into a look-up table before exit. So I am not amazed on my return when it now appears to know the



Professor Donald Michie is head of the Machine Intelligence Research Unit at Edinburgh University.

answer to 999,997 — repeating instantly "Yes" by looking up the answer in the look-up table. It turns out also to know that 999,991 is composite, having failed hopelessly on an earlier trial. The seeming miracle is traced to its use, for speeding up the computation of the new-found prime near 997.

On any reasonable definition, knowledge is here being created and used. Yet information remains constant, being fully contained in the original program. What, then, changes? Simply the size of that fraction of the total information which can be mobilised fast enough to satisfy the examiners.

With all respect to Mr Pettigrew and to the Crown, the Lords of Appeal may have a long row to hoe. REFERENCES Michie, D. (1988) Memo functions and machine learning. *Nature*, 218, 18-22. Michie, D. (1977) A theory of advice. *Machine Intelligence*, 4, Chichester: Ellis Horwood, and New York: Halstead Press (John Wiley) 151-168.

## £300 award to essay winner

JOHN FINNIE (right) of Solihull, who worked for GKN Group Management Services, has won this year's IDPM/Langton essay competition on the practical implications of office automation. He is seen here receiving his prize of a silver tray and £300 from Geoff Dale, head of British Telecom's telematics division.

Second prize went to Frank Bouff of Abbots Langley, Herts, while David Reed of Barnet, Herts, a consultant with CAP-CPP, won third prize. The judges were Geoff Dale; Roy Closs, director-general of the British Institute of Management; Dr Doug Eyelton, director-general of the Computing Services Association; Bill Herndon, vice-president of operations at Citibank; Brian Manley, managing director of Philips Business Systems; Barrie Sherman, director of research at ATMS; and consultant Eric Watson, who was last year's winner.



## IDPM subscription up 17 per cent

AT a confusing annual meeting of the Institute of Data Processing Management in London last week, an increase in subscriptions of about 17% was approved on the nod. There were about 80 members present, who raised many points on the finances of the institute during the meeting.

Ex-BCS president Garry Fisher called for conferences and seminars, which last about £1,000 last year, to break even in future and to be based on the basis of a minimum attendance. He also suggested that it was wrong for the institute to budget for a profit on examinations and advocated that these should be run on a subsidy to encourage people to become professional members.

Alan Simpson, a former Institute press officer, commented on the cost of nearly £7,000 for the year book and asked why, with all the adverts in it, it had not made a profit.

Secretary-general Ted Cluff said if the members wanted a year book and magazine of the present quality it involved high costs and postage.

A proposed change of rules drawn up by the Institute's solicitor aimed to allow postal ballots for vacancies on the council. This was agreed, but members were concerned that this could lead to one branch dominating the council. There was a call for the single transferable vote to be used and for the election to be supervised by the Electoral Reform Society.

Cluff said he would put a proposal for this method of voting before the 1981 annual meeting. He added that he hoped to be able to have full copies of the Institute's rules ready after that meeting.

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## IBM rivals 'unperturbed' by launch of Displaywriter

IBM's competitors in word processing have been largely unperturbed by the company's long-awaited announcement of the Displaywriter, a stand alone word processor with a full size screen (CW, June 28). The apparently low price of \$10,970 for a standard configuration is pointed out as entailing considerably more expense for software, training and support.

Some assistance is provided for users when the machine is purchased, but after that the service of a marketing support representative cost \$58 an hour. This unbundling is the start of a trend likely to be followed by other manufacturers. Pat de Cavaignac, president of Vidyec, commented: "We can't continue to offer consulting services free of charge."

Reaction to the product as a whole has been cool. A US spokesman from Wang said: "We were very underwhelmed at the pricing of the new product. IBM's Office Products Division had a morale problem because they had nothing to sell against the machines sold by Lanier (AES) and CPT."

"The IBM product will not affect our pricing or our marketing strategy, and with all those salesmen going out selling word processing, it is likely to increase our business rather than diminish it."

Harry Mallinson of AES Wordplex in the UK commented: "Four years after the advent of stand alone processors, IBM has produced a machine that works." He also thought that IBM's marketing efforts would generate more business for everybody.

IBM is emphatic that the Displaywriter is not intended to replace the small-screen Office System 6, pointing out that the System 6 has functions such as records processing and file merge that are not available in the new machine.

The Displaywriter uses an Intel 8088 16-bit processor chip, as does the forthcoming Nexos 2200 (CW, July 10) and the 25-line screen is made by Panasonic. The two models of display wheel printer offered are both of IBM design and manufacture, instead of the Qume unit IBM has been selling.

Observers feel the Displaywriter's features are not particularly impressive. US consultant Sanford Garrett said: "In terms of software and capabilities, Xerox and Wang systems have more flexibility, and have better search, scroll and sort capabilities."

IBM asserts that the lack of free training is not simply a component of the low price of the hardware. "Ease of use has made this training policy possible," said Ron Eich, office products director of product development.

**Direct booking**

COACH tours with the National Bus Company can now be booked directly into the Digital Equipment PDP-11/70 based reservations system from terminals in five regional offices of the company's travel agent subsidiary National Holidays. The communications links use 11 statistical and time division multiplexers supplied by IAL, the communications subsidiary of British Airways.

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## FOCUS

on filling those DP vacancies

THE shortage of computer personnel is an established fact of DP life, and now a collection of polls, surveys and reports all agree that there is a serious shortage of DP manpower and that the recruitment problem appears to be escalating.

There is a current shortage of 16,000 analysts and programmers and 6,000 electronic engineers (CW, June 7), and vacancies for programmers are said to be increasing at a healthy rate of 500 per month.

So far, so good — at least for the DP professional and probably the advertisement managers of the computing Press. But while the recruitment marketplace is flourishing, the news is not so good for DP management who have to cope with ever-increasing workloads, fresh applications and lower budgets. In such circumstances, competing for scarce talent has become a challenge.

For the company, the problem is one of retraining experienced personnel in the face of aggressive recruitment offered by the competition. For the recruiting company, the problem is that of recruiting attractive and engaging job adverts and designing whatever might appear to be the current pay scales. For the individual, the challenge is the ability to stay away from the lure of the job advert in an effort to discover the practical requirements of the position.

**TEN YEARS AGO**

The recruitment marketplace is flourishing, the news is not so good for DP management who have to cope with ever-increasing workloads, fresh applications and lower budgets. In such circumstances, competing for scarce talent has become a challenge.

To the DP professional, it is only of fringe benefit interest to know that the recruiting company is situated in the new Covent Garden piazza in close proximity to Peppercorn Park and a leafy residential area. What the individual would prefer is data on the rate of staff turnover, the amount of care and attention required for existing programs and routines, and the mix of computing technologies and equipment being utilized.

In the meantime, the service industry is busy taking advantage of the installation, maintenance, DPMs are having to contract but their systems requirements. If they are to meet time and budget factors, this pressure is in fact growing, as users demand more and more that their jobs are completed on schedule.

Often these new applications involve advanced level technologies which in many cases can only be handled by specialist system houses. In such cases, the cost could well be less sensitive matter than that of the confidence of delivery. By tradition, much of the computer industry operates a recruitment by working policy. Basic training is limited to input personal, otherwise it is a matter of check-book. The trainers were, unlike football, only the individual concerned and his company benefits. Apart from such organizations as the clearing banks and

government installations, which have adequate funds and resources available for prime training, most companies which wish to avoid joining the recruitment merry-go-round have to rely on an intake of graduates from universities and colleges. State schemes such as TOPS and Threshold can only make a limited contribution to the supply of pre-trained recruits, as can the various computer training schools.

At a time when the computer industry is one of the few ex-

isting areas of recruitment in the UK, the industry should be setting about offering job opportunities to unemployed school leavers — particularly those from the more depressed areas of the country. Providing the necessary training will not be an immediate solution, but action by such responsible bodies as the British Computer Society and the NCC will help to reduce unemployment, and DP job vacancies soaring, a merger and sort program is an urgent requirement.

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# Here's some ammunition to fire back at 'poor productivity' critics

SENSITIVE programmers must find themselves on the brink of paranoia as more and more people stand up at conferences and belabour them for their poor productivity. Everything is smaller, faster, better — annual growth rates of 15% to 30% abound in the industry. Everyone is pulling their weight except the poor beleaguered programmer, whose productivity is claimed to have risen a mere 3% a year over the past 25 years.

Well, it seems you have an ally at last.

Managers are scarcely able to agree what the product of your labours are, let alone agree on a common way of measuring productivity. That is the view of Thore Thorsen, of the New York consultancy Applied Computer Techniques.

Speaking at the Online Future Systems Forum in London, Thorsen chose to define the product as source code, object code, JCL procedures and documentation.

"But there are no standards by which to quantify productivity. By convention, the size of a program is measured in number of lines of source code. The punched card is dead, but its ghost will linger on for many years yet. Again, sometimes numbers of lines of code and numbers of statements are interchangeable, sometimes they are not."

"Other people, though, say that object code is a better measure, and they count it in bytes. But the amount of object code produced is a function of the number of variables such as the quality of the compiler and the individual quirk of the programmer."

"So we have a number of ways of measuring the size of a program. What about cost?"

"We tend to use man-months as a measure of cost. But other factors such as computer time contribute to costs and are variable. And when you choose to measure productivity in number of lines of code per man-month there is disagreement as to what constitutes a line. Some organisations count the blank lines put in for elegance, others do not. Some count macros as lines, others wait for the macro to be expanded before counting. Man-month accounting practices vary from organisation to organisation."

"So, by default, the industry has arrived at a measure of pro-

ductivity which involves dividing one very fuzzy unit of measurement by another. The result is very unreliable indeed," declared Thorsen.

"The best it can do is to give a measure of trends in productivity in a single organisation which has used the same standard of measurement over several years."

"An enormous number of other factors influence productivity: the larger the program, the lower the productivity is likely to be. The more people put on to different parts of the program, the more the productivity lost in the overhead of people

interactions. Program complexity, choices of access method used affect productivity. There can be an order of magnitude differences between the effort needed for a batch program and an interactive one."

"The performance constraints on the system — fast response times requiring shorter path lengths, the resource constraints, the reliability constraints, all affect productivity."

"Then there is the proficiency of the individual programmer, affected by intellect, motivation, experience. Are there any development tools available? Are they any good?"

Thorsen's next point will attack a chord with most programmers and probably appeals to most readers of Page Six.

"Programming is an intellectual task requiring enormous concentration. Yet 98% of applications programmers work in places which were never designed for programming, where the white noise, the distracting noise levels are far too high."

So next time you hear somebody moaning about low programmer productivity, be ready to come back with a few of the challenging arguments of Thore Thorsen.

## 'Our best hope lies in Ada'

THORE THORESEN presented the forum with a charming review of the progress of programming through the ages before outlining some of the methods which have been adopted to create some order out of the chaos of program development.

"In the early days, before 1960, there was very little commercial programming, and the programmer worked at the machine code level, picking up zeros and ones with tweezers and putting them into holes. Then came high level languages. It was marvellous. Suddenly anyone could be a programmer. — detrocked ministers, frustrated housewives. Programming became a sort of folk art."

"But by 1965, corporations became very disenchanted. Nobody knew what software was. It was intangible stuff. They ended up defining it as that which is never delivered on time, is never delivered at the promised cost, and never works when delivered."

"Around 1970, software engineering appeared on the scene to solve all the problems. It sounded great: the name implied a unified discipline, but in reality it was a

collection of disjointed techniques, each attacking one aspect of the development process."

"In the beginning, large projects were built in the same way that the Wright Brothers built their aeroplanes. You built the system, pushed it over a cliff, watched it crash and then went back to the drawing board. The top-down development approach which allowed the project to be broken down into pieces that could be tested as you went, appalled engineers who didn't believe in starting a building with the ceiling."

But in fact it is a reasonable approach. Then there is the structured walk-through, where the programmer presents his program to his peers, who proceed to tear it to pieces — and that approach can reduce the errors and discrepancies before it goes for testing."

"The chief programmer team approach recognises that in the development process, only a small part is coding, while a lot of it is administration."

"It is an attempt to mimic the surgical team, where one guy is in charge of putting the patient to sleep, another writes

the scalpel and there are a whole lot of nurses around to clear up the mess afterwards. It can be contrasted with the 200 programmer approach, where 200 programmers are thrown at the project and left to get on with it, which has been described as the hog butchering approach to development."

Nor was Thorsen very optimistic about the future. "Tools like structured programming can ease the problems, but they are often put in place without taking into account the human factor. Computer programmers are individualistic as a breed, and that goes against the disciplined principles of software engineering."

"We have to look at new methods of acquiring software — packages, automatic program generators do exist, but they only fit some applications."

As for non-procedural languages, Thorsen was very dismissive. "JCL is non-procedural and it's atrocious," he declared.

As for natural languages, they were too ambiguous. "You wouldn't gain much if you replaced Cobol with English: who the hell can write

English?" he asked.

The best hope he saw lay in the new Ada language.

"Ada integrates program specification and program implementation into the same language framework, so that you can compile the specification and the body of an Ada module separately and thus compile a complete specification tree and verify the design before you write a single line of code to implement the functions of the modules. The replacement of one body with another requires no reprogramming or recompilation of any other part of the program. And the Ada compiler is intimately associated with a database of information describing the modules already compiled, thus automating the management of modular program design."

Despite its apparent attractions, Thorsen doubts that Ada will replace Cobol as the dominant business language in the 1980s, but it could affect the future development of Cobol. Ada will be the primary programming language on Intel's forthcoming iAPX 432 32-bit microprocessor (CW, July 10).

And Fortran. "Everything Fortran says is clearly true, but whether his last comment will be fulfilled in the next decade is very much open to question. More and more software is being written in Cobol, and as time goes by, more and more users who were once innovative become diehards."

Perhaps with good online development tools we may do away with coding sheets, but an awful lot more Cobol is going to be written before the language follows Latin into the history books.

## CONFERENCES Computer Graphics

BUSINESS graphics, drafting, maps and simulation are some of the topics to be treated at Computer Graphics 80, to be held at the Brighton Metropole from August 13-15. It is organised by Online, the conference will highlight developments during the decade since Computer Graphics 70 was held at Brunel University. Details from Online Conferences Ltd, Artley House, Northwood Hill, Middlesex, BA1 1TS, tel: Northwood (08274) 2811.

### STRUCTURED DESIGN

A technical briefing entitled 'Structured Design in Management Information Systems' will be presented by Infotech from September 1-5 at the Holiday Inn, London. It is designed for DP staff responsible for evaluating potential innovations in systems and program design and explores the structured design of Myers and Constantine as well as Jackson rules for program design as well as subsidiary design languages. It will be given by Jeffrey Beal of Langton Information Systems, N. Colm Chorlton, an independent consultant, and John Buckle, European director of Softech. Further details are obtainable from Maurice Nicholas, Infotech, Nicholson House, Maldenhead, Berks, tel: 0633 3091.

### INTRODUCTION TO MINIX

A rapid introduction to minix computer systems is provided by IEE's vacation school, entitled 'Introduction to Small Computer Systems in Engineering Applications' to be held from September 7-11 at the University of Durham. The course is intended for young engineers and senior managers who are becoming involved with computers. Part 1 will cover basic design principles and Part 2, expected from an overview of various types of computer, an appreciation of software details, contact the Institution of Electrical Engineers, Computing and Control Division, Savoy Place, London WC2R 0BL, tel: 01-240 1891.

### ELECTRONIC DISPLAYS

Electronic Displays 80 is the name of the 10th International exhibition and conference devoted to the technology of electronic displays. It will be held at the Mount Royal Hotel, London from September 8-12. The main subjects of the conference are: device technology; human factors and interactive displays; and display systems including the use of microcomputers. Further information from Network, Printer House, 1st Floor, 111, Bedford Square, London WC1R 4EJ, tel: 01-240 1891.

### PERSONAL SHOW

The Personal Computer Show is taking place for the first time and will be held at the Grand Hotel, London from September 11-12. It was conceived to provide a marketplace where the industry could display the myriads of products now available in the word 'computer' and emphasise the fact that computers are now the work for people. It is sponsored by Personal Computer Show and organised by Mordwell, 111, Montague Square, London W1M 5AB.

### AUTOMOTIVE TECHNOLOGY

Isata 80 is the title of the 8th national symposium of automotive technology and automation with particular emphasis on microcomputers in the automotive industry to be held from September 8-12 in Turin. It has the support of the Isata-Com Association. Committees, made up of representatives from the passenger motor industry and the operation of Fiat, the conference languages will be English, French, German and Italian. Details from Isata-Com, 22, Ligon Park Avenue, Croydon, Surrey CR9 3EP, tel: 01-880 8800 and 01-880 8801.

## SOFTWARE FILE

### Children profit from Pet

APRIMARY school with its own microcomputer is selling programs for computer assisted learning to raise money for further computer equipment.

Deputy head Don Walton of Houghton County Primary School has developed programs covering a wide range of subjects for ages 4 to 13 years, and the machine, a Commodore Pet, is in use all day every day by the children, as well as after school hours for program development.

Headmaster Keith Luton is as enthusiastic as his pupils, and keen to increase the limited machine time available at the moment.

Some of the boys have even mastered programming. But according to 10-year-old Richard Baldry, author of one of the programs for sale, "the girls don't seem keen on learning how to program."



Primary school programmers Andre Savers, Mark Cusley and Richard Baldry with Houghton County's overworked Pet microcomputer.

### Q-Pac and teams sold

MANAGEMENT Sciences America is to buy the Q-Pac payroll system from its authors, Q-Packaged Programs in South Africa.

The acquisition will include the UK and US marketing and support teams and the South African development team. But the South African parent company will continue to act as local agent for the payroll system, alongside MSA's subsidiary selling the existing MSA software.

MSA's UK managing director Dan Schmidt said: "In the last three years the market outside the US has provided an in-

creasing proportion of MSA's revenues. The MSA payroll software is not flexible enough to handle the different legal and tax requirements of this market so we had the choice of revamping it, starting again from scratch, or looking outside."

"We are buying what we believe to be the best product available to complete our range of international cash management products."

"Q-Pac will also be useful in the US because it can run on some hardware that cannot take the MSA system — for example the IBM System 34," he added.

## Why more airlines switch to Univac

IBM is losing its airline customers to Univac, on the strength of the Univac Standard Airline System software. Finnair and Cathay Pacific have both switched to Univac, as have another national

the software for freight handling and cargo automation, and other deals are under negotiation.

Univac's multi million dollar investment in airline software goes back eight years. An international workforce of over 200 people, many of them drawn from the airlines, concentrates on specialised software at the development centre in Minneapolis.

Univac's aim is to establish an industry standard against which airlines can measure themselves, by developing generalised application modules which will meet the common requirements of airlines as well as being easily adaptable to individual strategies and economic needs.

According to Jim Turner, director of the airline development centre, USAS has outstripped IBM's rival system PARS, having the advantage of newer technology in its development as well as Univac's long and close association with the airlines.

USAS runs on the 1100 series under the OS 1100 software which allows easy upgrades to larger mainframes. It is written mostly in Fortran, with some elements in Cobol, mostly for historical reasons. Finnair has been using Univac for a long time.

Its main modules include passenger reservation, automated ticketing, hotel reservation, a fare display model, with lock-up and information retrieval, passenger check-in, seat selection, fare calculation and a trading module.

The other automation and freight handling subsystem has proved to be a selling feature on its own, dealing with all aspects of cargo including administrative, distribution and accounting.

Another feature which has a number of buyers is the message handling module of USAS which is used in Scotland, Norway, and elsewhere.

Others planned or already under development include maintenance and engineering control, passenger revenue accounting, and flight operations. The specification of Univac's software in collaboration with over 50 airlines.

## Release 1 of IBM System Product

IBM's latest announcements of upgrades on all fronts for large systems and significant enhancements to MVS suggest that customers are being encouraged to embrace the 303X series wholeheartedly while users sit back and wait for H (CW, June 19).

The Job Entry Systems JES2 and JES3 are to be fully integrated into the MVS System Extensions, to be referred to as Release 1 of System Product MVS/SP.

SP Release 1, planned for January 1981, will give base support for the new disc devices 3375 and 3380, plus disc and data streaming channels. It also gives operators console support for the 3270 large screen and colour VDUs.

Also planned for January 1981 is the Data Facility/Data Set Services dump restorers which will support the new disc devices with improved performance, allowing selective control, full volume dumps and dataset dump restore.

There will also be a Migration Aid for the direct access storage device to assist users converting to the 3375 and 3380. The product modifies existing JCL, directing it to the new discs and produces JCL for copying and backup, modifying and optimising on block sizes.

Planned for April 1981, the licensed program Data Facility/Extended Function will provide improved performance for MVS and a new caching structure in which volume ownership restrictions are lifted. It will allow data in VSAM catalogues to be organised with far more flexibility.

In September 1981 Release 3 of the Hierarchical Storage Manager is due, providing extra control software for IBM's mass storage system which will support the new disc devices, improve performance and take automatic tape backups rather than backing up to disc or mass storage.

At the same time there will be a new version of the Resource Measurement Facility whose enhancements include exception reporting for such eventuality as disc pack over-use.

Release 2 of System Product is planned for July 1981 and will include upgrades that are the result of requests from the user groups Guide and Share. Also planned are architecture enhancements in 3000 range and global resource serialisation for MVS.



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1	3	5
4	8	7

IN this miniature version of the 16 Puzzle, the problem is to get the numbered blocks into a circular sequential mode in only 16 moves, with the figures running in clockwise to 8 order clockwise around a blank central square.

A "move" must consist of sliding one block into which ever square happens to be vacant at the time. Lifting a block out of the frame before replacing it is not allowed. See page 87 for solution.

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## PEOPLE and EVENTS



## We are the Champions

THE I.C.I. Information Processing Team (above) admire the trophies they won in the Business Equipment Trade Association 7th annual golf tournament, played over 36 holes at Foxhills Golf and Country Club, Otterham, Surrey.

The tournament was entered by teams from, among others, Facit-Addo, IBM MDS, Nexos, NCR, Honeywell, and Univac.

Graham Castell (left) holds the trophy donated by the magazine Business Systems and Equipment.

## Pactel MD appointed to Monopolies body

PACTEL's managing director, Holman Hunt, has been appointed to the Monopolies and Mergers Commission.

Hunt has been in the computer industry since 1957, most of the time with P.A. In the 1960s he built up P.A.'s computer business, and in 1970 joined the board of P.A. Management Consultants, where he was responsible for directing a group of divisions operating in the computer field.

On the formation of Pactel, P.A. Computers and Telecommunications, in 1976 he became its managing director. He has also been president of the Institute of Management Consultants.

The Monopolies and Mergers Commission exists to advise the Secretary of State for Trade on possible monopolies and on whether they, and planned mergers, are against the public interest. It also advises on situations which may be anti-competitive, and on possible abuse of "positive planned monopoly situations".



## Tony Higgins leaves CW

Tony Higgins, acting editor of Computer Weekly, is leaving to join Sperry Univac UK as a consultant dealing with the company's press and publicity activities.

Higgins, who as news editor and deputy editor has been involved with the running and production of Computer Weekly since its inception in 1968, has played a major part in the development and success of the journal which has always been a world leader in the computer industry.

Betty Prince, until lately International memory product marketing manager with Motorola in Austin, Texas, is moving to East Kilbride, Scotland where her title will be memory product marketing manager.

## Nominate a Marconi Fellow

NOMINATIONS are invited for the Marconi International Fellowship, a £25,000 prize to be made available to a contributor to communications technology or its application improving the lives of children.

This is interpreted broadly to include computer-aided medical diagnosis and teaching, overcoming handicaps.

Previous winners of the fellowship have been in India, Japan, the UK and the US.

Nominations should be sent to Marconi International Fellowship, Aspen Institute of Human Studies, 1229 University Ave, Boulder, Colorado 80302, US.

Alan Senior, until managing director of Systems International and Computer Visualisation, has joined Capel Financial, the 18th Avenue, New York, where he is responsible for peripheral marketing. Senior's previous employers were the Defence Ministry and Elliott 803 for television.



Kaminski Senior

## OBITUARY

## Peter Haines

PETER HAINES, director of Software Sciences International, died at the age of 57.

Haines became involved with computer systems in 1954 when he worked on the design and implementation of the Apollo ATC system for the Oceanic area. In 1959 he joined the aerospace consultancy General Precision Systems, and became managing director in 1970.

In 1971 the company merged with Software Sciences and he took the position of marketing director which he held until his death.

Philip Brown has joined the NCC to handle the Cobol aspects of the Standards in Computing programme. Previously, he spent nine years in software engineering at Burroughs, and he has lately been chairman of the ECMA technical committee on databases, and a member of ECMA, Codasy, BSI and ISO Cobol committees.

Nat Wolff has joined X-Data as controller, spare spooler and services. His last job was as repairs controller with DRI.

## DIARY

SEPTEMBER 1-3

Microprocessor workshop, Computer Lab, University of Liverpool.

SEPTEMBER 4-5

Logic and microprocessor system design course, Computer Lab, University of Liverpool.

SEPTEMBER 14-16

CAPP-80, typesetting seminar, Royal Lancaster Hotel, London. Details: CAPP-80 Conference Unit, 01 638 8888.

SEPTEMBER 23-26

Micrad 80, CAD conference, Madrid, Spain.

SEPTEMBER 24

New technologies for information retrieval, BCS Information Retrieval Group, London.

NOVEMBER 6-7

Micro, micro and terminals, world series, 1980/81, Manchester.

NOVEMBER 14-16

More than just techniques, conference, British Production and Industry Control Society, Blackpool.

DECEMBER 11

Computers in museums, BCS Information Retrieval Group, London.

## MICRO NEWS

## Does UK really need Inmos?

STILL no decision has been reached on the future of Inmos, the NEB-backed UK microelectronics company. The National Enterprise Board is currently reviewing the company (for the third time) in the hope that the Tory government will grant the second £25 million promised by the previous Labour government.

If it does, Inmos in the UK will have a future as the sole UK manufacturer of standard microelectronics components.

Before any decision is made, however, Sir Keith Joseph, Secretary of State for Industry must answer the question he posed at the last Inmos debate. Does the UK need to produce its own standard integrated circuits, or can it rely on foreign companies setting up here?

Inmos's answer to this is that this country does need its own standard LSI manufacturing facility, and its own research and development in that area, in order to keep at the front edge of the technology. According to Ian Barron, the UK director,

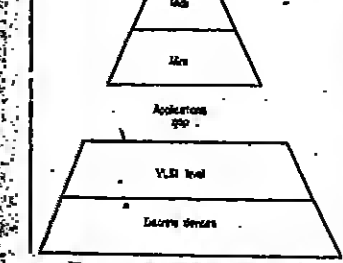


FIGURE 1: Microelectronics and computer markets.

his company will do just that; Inmos will be innovative in about 10 years' time.

In Barron's view, US company offshoots set up in the UK do not operate at the front edge of technology, and therefore should not be relied upon as a source of standard integrated circuits. This factor is becoming more important as silicon itself represents increasingly a higher cost factor in microelectronic products.

If Inmos does ever reach the stage of being innovative and develops high demand products this will benefit both company and country. In the meantime the company is concentrating on production of standard LSI devices such as 16K static RAMs, 64K dynamic RAMs and microprocessors against fierce competition.

Taking the opposite view, Intel believes that the UK should not be producing its own integrated circuits, but should rely on other companies, including itself, to supply them. In fact engineers in this country should be concentrating on utilising them and designing applications.

Intel sees the microelectronic and computer markets in a single triangular-shaped spectrum (see Figure 1) with increasing performance moving up the triangle. At the lower performance end are discrete devices and VLSI devices, while at the top are mainframes, midsize and minicomputers, leaving a gap in the centre of the triangle. This gap, the "applications gap", Intel believes represents between £1 and £2 billion in the UK over the next five years.

According to Tom Lawrence, vice president for Europe, hardware and software technology is already increasing in sophistication faster than it can be used. Engineers in the UK should be taking advantage of this and exploiting the applications area.

In the microprocessor development business Intel stresses that the development of a basic CPU alone takes an average of 12 man months. The input/output communication takes another 80 man months, the operating system development another 120 man months, and applications languages like Pascal and Cobol another 1,200 man months.

To become competitive in the microprocessor business Inmos has to put in a similar amount of effort. This leads to a second question, that Sir Keith Joseph is probably trying to answer. What chance does Inmos have of succeeding in its aim?

Paul Schroeder, design director, originally felt that Inmos was in a position to pull off the same trick with its memory products, the 64K dynamic RAM and 16K static RAM, that Mostek pulled off with the well-known introduction of its 16K dynamic RAM (CW, November 8, 1979), now an industry standard.

When working for Mostek, Schroeder designed a 16K dynamic RAM that was better suited to industry requirements than others already on the market.

including Intel's. Mostek released it just as Intel's sales started to rise and consequently took over the market.

If Inmos had been allowed to keep to its schedule this would still be the case. Now, the seven-month delay could jeopardise the whole plan.

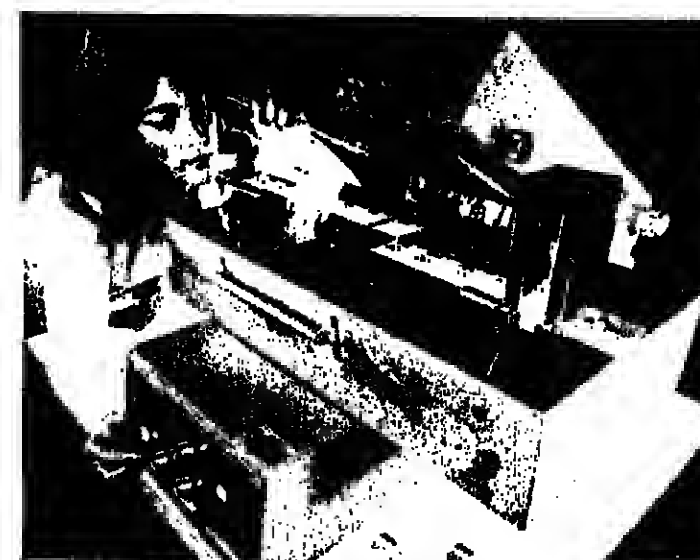
Inmos' 16K static RAM, called the IMS 1400, is due to be sampled at the end of the year, while Intel's 2167 is to be sampled this quarter, ready for volume production in the first quarter of next year. Mostek has already sampled its 4184 (CW, July 10).

Other competitors include Texas Instruments and Motorola who plan to be in volume production by the end of the year and early next year, respectively. Motorola will sample its 2K by 6-bit 4018 in Europe in November, and its 16K by 1-bit 2167 early next year.

Fairchild's 2K by 6-bit device will be available in sample form in the last quarter of this year and should be in volume production by the second quarter of next. Meanwhile, at least three Japanese companies will be participating in the 16K static RAM market: Hitachi, Toshiba and Mitsubishi.

On the 64K dynamic RAM scene, Inmos has almost lost its chance. Motorola has already shipped in volume to its European distributors, and Texas Instruments has just released samples in the UK, hoping to be in volume production next year. Hitachi produced samples in April this year.

Mostek is due to start releasing samples next month and expects to be in volume production by the end of the year, while Fairchild hopes to be in volume production early next



DEK Printing Machines' 1202RS modular system prints onto thick film circuits, liquid crystal displays and microelectronic components up to 102 by 102 millimetres at a resolution of more than 2.5 microns. At a cost of £8,370, the basic model for laboratory work has to be loaded by hand and will print 500 substrates per hour. A fully automatic version, which costs around £10,000, will print 1,200 substrates per hour.

year. National Semiconductor and Intel do not expect to have samples until next year. NEC, Toshiba and Fujitsu will also be competing.

The longer Inmos is delayed and prevented from mass producing its memory products, the less are its chances of succeeding.

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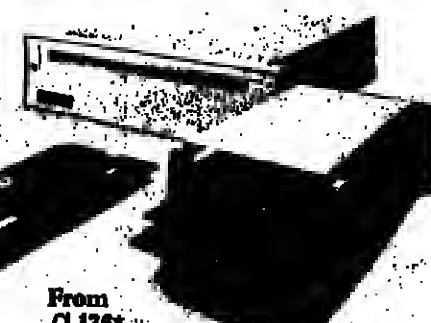
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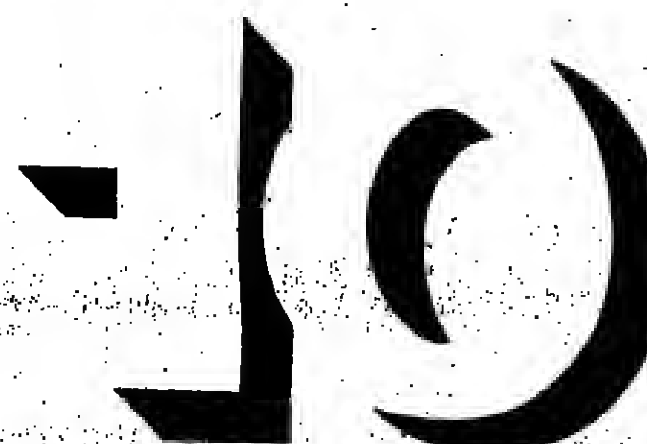
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## MALCOLM PELTU TALKS TO PROF WILKES WHO HAS RETIRED AFTER 34 YEARS AS HEAD

Professor Maurice Wilkes became director of the Cambridge University Mathematical Laboratory in 1946, which became the Computing Laboratory in 1970. Construction on its first computer, Edsac, began in 1947 and the first automatic calculation was performed in May 1948, with a regular user service beginning in 1950.

In 1951, Professor Wilkes, with Cambridge colleagues David Wheeler and Stanley Gill, published what is now regarded as the first programming book, *The Preparation of Programs for an Electronic Digital Computer*.

He recalls that, at the time, the

publishers, Addison-Wesley in the US, doubted whether there would be a market for a book on the new-fangled programming concept so the terms of the contract were that no royalties would be paid on the first 1,000 sales, double royalties for the next 1,000 and then normal royalties for further sales. With a sigh, Professor Wilkes recalls that they sold over 2,000.

In 1951 Professor Wilkes also put forward the concept of microprogramming, a phrase he coined, including, he claims, the concept of "bit-slicing" which has now become a major architectural feature of many systems.

In 1952 he presented a paper in Toronto which explored the important distinction between systems and applications programming.

The work of the Edsac team on programming methodology provided a crucial influence on early software development and computer use.

During the 1960s and 1970s, Professor Wilkes became more interested in questions of systems reliability and distributed processing, which culminated in the development of the Cambridge Ring for which his successor, Roger Needham, received a SCS Award in 1979.

# A lifetime of discoveries

NEXT month, Professor Maurice Wilkes will start his latest adventure of discovery. After a lifetime at Cambridge University where he has led a brilliant team into uncharted computing territory, he is moving in the US to do research for Digital Equipment Corp.

The achievements of the Cambridge computing team which he has directed since 1946 represent milestones in computing history and have become an intrinsic part of modern DP life.

Concepts of programming methodology such as subroutine management, debugging aids and even structured program-

ming can trace their roots to work on the first Cambridge computer, Edsac.

Professor Wilkes himself coined the term "microprogramming" to describe the level beneath the instruction set interface and one of the Edsac group, Professor David Wheeler who is still at Cambridge, can lay claim to the first operating system routine, a 40-instruction link loader for Edsac.

More recently, the most important achievement of the laboratory has been the Cambridge "Ring", one of the world's leading local networks, which has enormous potential for distributed office information sys-

tems as it allows simple interconnection of a variety of devices along a wideband data highway.

It is interesting that the professor's new employer, DEC, recently joined with Xerox and Intel to develop such local networks, based on the Xerox Ethernet (CW, June 26). At this stage, however, Professor Wilkes said he had not thought about any specific work that he will be doing at DEC as the mechanics of moving to the US are dominating his mind.

He declined to make any comparisons between Ethernet and the Ring, other than to say that each had its merits and its

limitations.

Making theoretical comparisons is not Professor Wilkes' style. As he says, "I have always been a practical man."

His approach to the development of Edsac illustrates his delight in practical experimentation rather than theory. In fact, Professor Wilkes' contribution to computing is probably best viewed in relation to commercial data processing rather than computing science. He could be seen as one of the first — if not the first — data processing manager.

When he established the Edsac computing service in May 1948 he gave prima consideration to its role in providing a service to users. And he adopted two principles which are still part of any DP manager's credo: be technologically conservative and give priority to good software development methodologies.

The main innovations of Edsac (Electronic Delay Storage Automatic Calculator) were in its software strategy and nothing new was attempted with the hardware — the memory consisted of five foot long tubes of mercury.

His decision to concentrate on creating a stable program development environment based on systematic design and debugging methodologies, strict documentation standards and ease of user-programming may not seem remarkable now.

But at the time, he recalls that programming was dismissed either as a "dog-eat-dog" task with little intellectual challenge or as being of minor significance because programs would be needed to solve only a few problems.

At a Toronto conference in 1982 he also identified the

important distinction between systems and applications programming. To ease applications programming, Edsac had a simple symbolic order code at a time when digital machine code programming was the norm.

Professor Wheeler — whom Professor Wilkes has described as a "programming genius" — developed the "initial orders"

link loader to read the coded programs and the simple and flexible language of subroutines. The latter Gill developed, and the program library was built up by the Edsac group.

This practical approach used as the basis for commercial computer development in the 1950s and 1960s.

Professor Wilkes developed the Edsac group's routine and subroutine library as the basis of a service.

Leo provided the link from the laboratory to the rest of the world. The "ed" in Edsac was the electronic office that the Cambridge Ring had to have.

But "ed" was not just a name. It was a way of life. It was a way of thinking. It was a way of working.

It was a way of life. It was a way of thinking. It was a way of working.

It was a way of life. It was a way of thinking. It was a way of working.

It was a way of life. It was a way of thinking. It was a way of working.

It was a way of life. It was a way of thinking. It was a way of working.

It was a way of life. It was a way of thinking. It was a way of working.

## OF CAMBRIDGE UNIVERSITY'S COMPUTING LAB



## Milestones in history that have become part of modern DP life

From page 12

seem strange to those people who say they feel intimidated by his spiky, didactic manner.

However, he does dismiss with acid irritation views which he particularly disapproves of. For example, he is enthusiastic about personal computer "hobbyist" developments. "Never underestimate the young," he said, with eyes sparkling.

But when about those, such as Professor Edgar Dijkstra, who claim that bad programming practices in the hobby world have set programming back 25 years?

With some anger, he roared that this was a typical elitist view of those who remember a time when there were a few highly skilled programmers. Even if some Basco programming is poor, he said, the placing of computing power in the hands of young enthusiasts should be welcomed wholeheartedly.

He views personal computing with a special affection because it captures the spirit of amateur exploration which characterised the early days of radio hams.

As a boy, Professor Wilkes was keen on radios. His initial research at the Cavendish Laboratory was in wave propagation and, during the Second World War, he worked on radar development. But he says that his amateur passion for radio was not abandoned when he began to study the subject seriously.

Of the major developments in DP during the last three decades, Professor Wilkes has personal recollections of two: during the 1950s he remembers being present at the Massachusetts Institute of Technology (MIT) when "magic core memory" was tried out for the first time. He recalls the "look of awe" on everyone's face because it "just worked" — and worked reliably.

In 1967, on a summer study tour at MIT, he saw the first online console, which was the Project MAC.

Both these were significant advances in DP with core providing the necessary reliability and time sharing the opportunity to give more users access to the machine.

After all, distributed processing is really a development of the concepts introduced with time sharing.

commented.

But the greatest revolution — microelectronics — occurred without any signal event to stick in the mind but just a rapid surge of exciting possibilities. "We are only half way through the semiconductor revolution."

"We have got low cost processing power but have not yet seen the availability of really low cost memory. When this happens, the potential for distributed computing will be expanded significantly," he commented.

But he refuses to be drawn into trying to predict specific future developments, as he believes that the only predictable

Engineering of Illinois University. Their personal enthusiasm and the excitement of their proposals for stored program control inspired the young Wilkes to start building Edsac on his return to Cambridge.

"It is a glaring injustice that Eckert and Mauchly have not been recognised for their contribution to computing in the way that the Wright Brothers have achieved fame in aviation," he said.

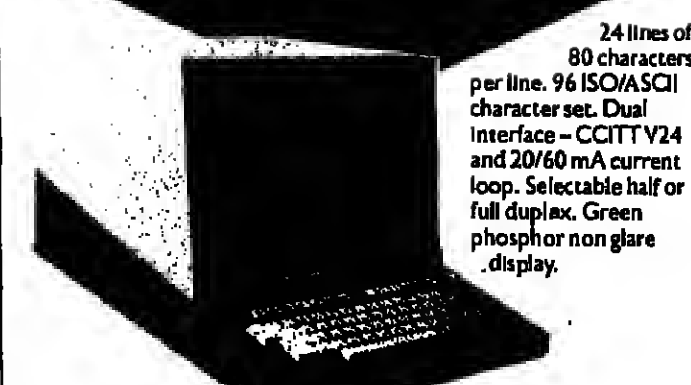
John von Neumann has often been recognised as the author of a report published in 1945 for the Edsac system which first formalised the idea of stored program control, but Professor

One of the most important achievements of the laboratory has been the Cambridge Ring which is said to be one of the world's leading local networks and to have big potential for distributed office information systems, as it allows simple interconnection of a variety of devices along a wide data highway.

Here Professor Wilkes shows Malcolm Pelto the circuitry in the Ring's central unit which is housed in the laboratory's Titan Room.

Most of the circuitry is on removable boards, one of which was to be given to him as part of a retirement presentation. Each of the boards can now be replaced by the same circuitry on a micro chip.

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1 x 7829/00	1 x 7830/00
1 x 7831/00	1 x 7832/00
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1 x 7837/00	1 x 7838/00
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1 x 7841/00	1 x 7842/00
1 x 7843/00	1 x 7844/00
1 x 7845/00	1 x 7846/00
1 x 7847/00	1 x 7848/00
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1 x 7877/00	1 x 7878/00
1 x 7879/00	1 x 7880/00
1 x 7881/00	1 x 7882/00
1 x 7883/00	1 x 7884/00
1 x 7885/00	1 x 7886/00
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1 x 7889/00	1 x 7890/00
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## ADVANCED FILE DESIGN—Part 15

by Owen Hanson and Norman Revell

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THIS series has provided the reader with a review of the present state of knowledge in the field of file design. Taken together with Basic File Design, all the principles that a designer requires to optimise file performance have been set out. This is intended to cover the needs of professional data processing staff; however, information at two other levels is often useful.

The first is a full explanation of the derivation and application of the various principles, with worked examples where necessary. The second is reference to the original sources from which information has been obtained. This concluding article covers these two areas.

The authors have not in the past been able to recommend any single book that covers all aspects of file design. For this reason Owen Hanson has recently completed a comprehensive text for Pitmans, which will shortly be published under the title Design of Computer Data Files. This is intended to set both as a reference and learning text, with a great deal of unburnt information to aid design decisions.

The original sources of information given in this series are

numerous, and for convenience they have been grouped into a number of areas:

**Record format and handling**  
Optimisation of Tape Operations, by E. S. Walker, Software Age, Aug/Sept. 1971, 18-17.

**Blocking Sequentially Processed Magnetic Files**, by S. J. Waters, Computer Journal Vol. 14, No. 2, 199-112.

These papers cover the derivation of theoretical optimum blocking factors on magnetic tape. In practice an integer solution is required, as blocks of 6.38 records are not generally feasible — although J. Ingala and E. G. Dee discussed the possibility in Flexibility of Block-length for Magnetic Files, Computer Journal, Vol. 16, No. 4, 1973, 303-307.

Walker (above) and B. J. Edwards, in Choices of Block Sizes for Magnetic Tape Files, Computer Journal, Vol. 20, No.

1, 1977, 10-14, give programs to calculate the optimum blocking factors, Walker in Fortran, and Edwards in Algol. This last provides the optimum integer solution.

**Sequential files**  
Sectioning of magnetic tape files was discussed in Basic File Design. The Choice between Magnetic Tape and Magnetic Disc for Sequential File Processing, by Owen Hanson, appears in the Proceedings, ADV Kongress, March 1980, Vienna. This provides the detail on which the analysis given in the series was based.

**Statistical Searching of Sequential Disc Files**, also by Owen Hanson, is a City University Business School Working Paper available from the Librarian, CUBS, 23 Goswell Road, London, EC1M 7BB.

**Direct files**  
Addressing algorithms have been discussed by many writers.

The most important contributions are:  
Addressing for Random Access Storage by W. W. Paterson, IBM J. Res. Develop, Vol. 1, No. 2, April 1957, 130-148.

**File Organisation and Addressing** by Warner Buchholz, IBM Systems Journal, Vol. 2, June 1963, 88-111.

These two papers reviewed the whole field, and are regarded as classics.

**Key-to-Address Techniques: a Fundamental Performance Study on Large Existing Formatted Files**, by V. Y. Lum, P.S.T. Yuen and M. Dodd, CACM, Vol. 14, No. 4, April 1971, 228-239, investigate randomisation applied to eight large files, Kalmann, in Structured Information Files, published by Melville Publishing Corp, 1979, got rather different results in examining a single large file.

A Practitioner's Guide to Addressing Algorithms by D.

Sevarance and R. Duhne, CACM, Vol. 19, No. 6, June 1976, 314-328, looked at the whole field of algorithms once more. The results of these studies differ, and they have been assessed and used in this series to give an overall view of randomisation.

Many of the same references have examined methods of minimising the effect of synonyme once a suitable algorithm has been chosen. Other sources in this area are Handling Overflows in Direct Files by Owen Hanson, Proc 8th Australian Computer Conference, Canberra, 1978, Vol. 2, 862-880; An Indirect Chaining Method for Addressing on Secondary Keys by L. R. Johnson, CACM, Vol. 14, No. 5, 1961, 218-222; Improving the Efficiency of Randomly Organised Files by Loading in Access Frequency Order by Owen Hanson, CUBS Working Paper No. 7, available from the CUBS Librarian, as above. Between them, these sources will provide the reader with a very full coverage of direct files.

**Indexed sequential files**  
The main sources of information here are File Organisation and Evaluation Modelling System (FOREM) by V. Y. Lum and P. J. Owens, See Information Systems, Cols IV, Plenum, New York, 377-387 and earlier references.

They describe optimisation techniques.  
Quantitative File Evaluation and Design, by A. Y. Montgomery and D. Hubbard, Proc. 8th Australian Computer Conference, Canberra, 1978, Vol. 3, 1242-1268. This paper, and earlier work by the authors, compares IBM and ICL 1900 series software.

**Modelling of Indexed Sequential Files: Monitoring Disk Transfers** by Eva Huzan, Computer Journal, Vol. 22, No. 1, Feb. 1979, analyses the operation of ICL 1900 series software in detail.

**The Hidden Speed of ISAM** by F. T. Corry, Datamation, June 15, 1971, 48-49, describes how to optimise ISAM files.

**Choice between file organisations**  
Choosing Between Sequentially and Indexed Sequentially Organised Files for Sequential Processing, by Owen Hanson, Proc. 8th NZ Computer Conference, Auckland, Aug., 1978.

Vol. 2, 136-155.

Entry to the File: Random or Index by R. A. Kalmann, Data Processing Magazine, June 1966 Vol. 8, No. 12, 18-21. Part 1968, Vol. 10, No. 12, 24-27.

**Direct or Indexed Sequential**  
Owen Hanson, Proc. 8th NZ Computer Conference, Auckland 1978, Vol. 1, 617-588.

**Indexed Sequentially Random**  
by G. M. Nijssen, IAC Joint Vol. 4, No. 1, 1971, 27-37. The paper concentrates on how updating of the two types of file the others cover a wider field.

**Database systems**  
There are many references in this area and a number of books are suitable as sources. Three of the most useful are:

Fundamentals of Database Systems by Den, published by Macmillan.

Computer Database Organisation, and Principles of Database Management both by James Martin, published by Prentice-Hall. Specific areas of interest are covered in Practice Aspects of Database Systems by Norman Revell, Proc. ICC Conference, Bangkok, 1977, and The Impact of Implementing Database Systems in Organisations, by Jenni Sharfend and Hanson, 8th Australian Computer Conference, Canberra, 1978, Vol. 4, 1612-1624.

**Online systems**  
The most comprehensive reference here is Design of Real-Time Computer Systems by James Martin, published by Prentice-Hall. Other points are made in Parallel Programming by Tom Gilb, Datamation, Oct. 1974, and A Survey of Security of Online Systems in the UK by Norman Revell, Proc. ADV Kongress, Vienna, 1978, 387-40.

**Security**  
A very useful general reference, giving a wide coverage at an advanced level. Keeping Computers Under Control edited by Andrew Chabers and Owen Hanson, published by Gae and Co. The papers make up the book reviews most of the major courses for further study.

It should be emphasised once more that most readers will not require the great bulk of these references, since the series provides a complete coverage of file design for the DP professional.

**BASIC FILE DESIGN**  
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## CALLS FOR PAPERS

## Electronic design automation

THE European Conference on Electronic Design Automation is to be held from September 1-4, 1981 at the University of Sussex. Its aim is to consider advances in analysis, synthesis, modelling, simulation and layout for the design, manufacture and testing of electronic components, circuits and systems. It is organised by the Institution of Electrical Engineers in association with the Institute of Electronic and Electrical Engineers Region 8 and Circuits and Systems Society, the Institution of Electronic and Radio Engineers and with the support of the Convention of National Societies of Electrical Engineers of Western Europe.

Synopsis should be submitted to the IEE Conference Dept, Savoy Place, London WC2R 0BL, by September 1, 1980, and further details can be obtained from the same address.

**50th ANNIVERSARY**  
To mark the 50th anniversary of the Institution of Engineering and Technology, the IET is publishing a special issue of the Journal of Engineering Technology, entitled 'The IET: A History of the Institution of Engineering and Technology'. The issue will be published in November 1980 and will contain a wealth of information on the history of the Institution, its achievements and its future prospects. The issue will be available to members of the Institution for £1.00 and to non-members for £2.00. It will also be available to libraries and other institutions for £5.00.

## COMPANY NEWS

## Reshuffle at the top in CDC

THE succession to William Norris, founder and guiding light at Control Data Corp since its formation in 1957, has been secured with the appointment of Robert Price, head of the computer division, to the post of president and chief operating officer.

Norbert Berg becomes deputy chairman, and William Norris remains chairman and chief executive. The trio will come together in a new corporate executive until Norris decides to retire.

Despite the expectation aroused by the appointments that Price would then become chief executive and Berg chairman, Norris says that there are no commitments to the two officers.

Both men, however, reflect the personal Norris commitment to social programmes: Price is credited with having turned the large computer business around so that people no longer talk about Control Data dropping out of the mainframe business, while Berg has been responsible for much of Control Data's admirable social work, such as employing ex-convicts and aiding plants in run-down inner city areas.

Earlier this year, the company announced plans to invest \$8 million in the run-down West

Parkside district of Philadelphia, either renovating an existing building or starting anew. The centre would include all the facilities that small businesses need but cannot normally afford, including training and management assistance as well as things like copiers and telex links. Control Data will run it, offering tenancies to small companies with a rent including all the ancillary services. Other centres are being established in Minneapolis, St Paul and Toledo (CW, January 10).

Second quarter figures from the company show net profit up 3.7% at \$39 million on turnover up 22.3% at \$943 million. The figures show the benefit to Control Data of owning a financial services company, Commercial Credit. In recent quarters, Commercial Credit has performed poorly and computers have made all the running.

But this time, computer profits were up a mere \$100,000, the rest of the profit advance coming from Commercial Credit.



## Recession hits Burroughs, misses IBM

FOLLOWING three very poor quarters by its own high standards, IBM is back on course, but Burroughs shocked Wall Street with a 12% profit fall in the second quarter, its first since 1963.

After blotting its copybook with net profit slightly down in 1979 over 1978, IBM has resumed its onward march in the first six months of 1980, with profit gain in the second quarter back to 1978 levels at 14%.

For the six months, net profit rose 11% more modest 8.2% to \$1,445 million on turnover up 12% at \$11,929 million. In the second quarter, net profit was \$763.8 million — 14% up — on turnover which advanced 15% to \$8,180 million.

IBM has been manipulating its prices to encourage outright purchase, and the adjustments are paying off. Outright sales in the second quarter were 15% above those for the first quarter of \$2,450 million, while rentals and services income was up a more modest 3.4% at \$3,740 million. The figures actually reflect a sharp dip in the rate of purchase in the first quarter of 1980, because comparison with the second quarter of 1979 shows sales up 17% but rental and services also up 15%.

Pre-tax margins remain under pressure, with the second quarter figure standing at 10.6%, up half a point over the first quarter, but down from 21.2% in the second quarter.

At Burroughs, the picture is in sharp contrast to that at IBM, with production and scheduling problems causing a 12% pre-tax profit slump to \$80.9 million on turnover up a modest 7% to \$735.2 million.

Specifically, the company says that problems with the Burroughs Modular Terminal series and the new 9001 family of machines were behind the profit slide. Component shortages, delays in manufacturing training programmes and strikes at plants in Detroit all contributed to what a "source close to the company" estimates as lost sales of over \$30 million in the quarter.

Burroughs is not forecasting immediate improvement, but expects to report an overall profit rise for 1980 as a whole.

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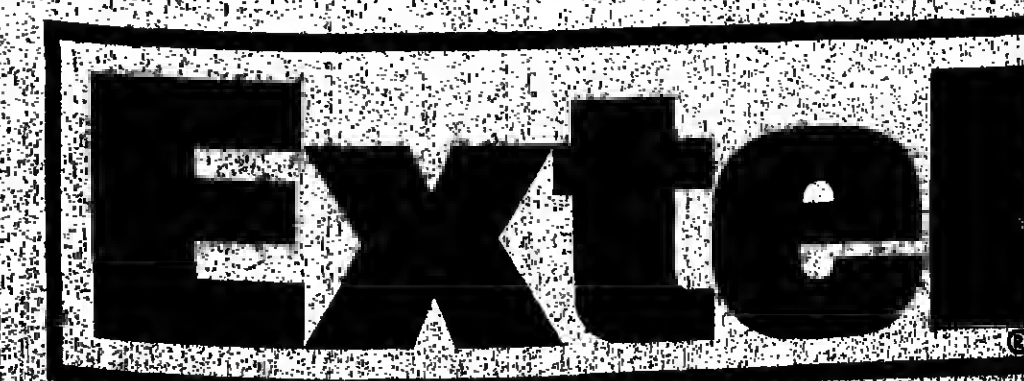
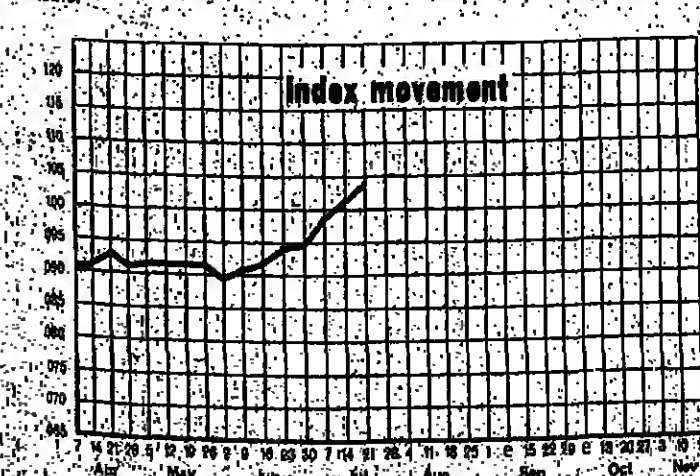
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## CW SHARES TABLE

Index	Low	High	Price	Change	Index	Low	High	Price	Change
100	100	100	100	0	100	100	100	100	0
101	101	101	101	1	101	101	101	101	1
102	102	102	102	2	102	102	102	102	2
103	103	103	103	3	103	103	103	103	3
104	104	104	104	4	104	104	104	104	4
105	105	105	105	5	105	105	105	105	5
106	106	106	106	6	106	106	106	106	6
107	107	107	107	7	107	107	107	107	7
108	108	108	108	8	108	108	108	108	8
109	109	109	109	9	109	109	109	109	9
110	110	110	110	10	110	110	110	110	10

The table shows the closing prices in London and New York at the end of last week. The share index is based on the prices of the UK companies in the table.



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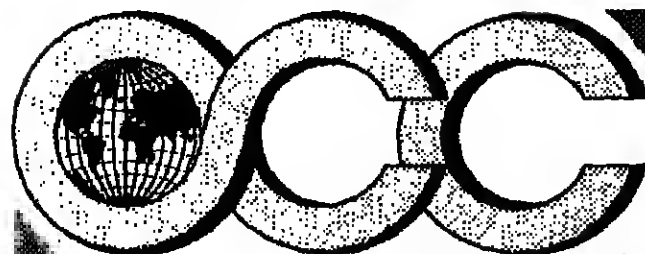
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### ● Systems Programmer to £9.5K + car Pre & Post Sales Support to £9.5K + car

A computer manufacturer in Herts wishes to recruit the above  
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end/or mini background with comm's experience would be ideal.  
U.K. and possibly European travel will be part of your duties.  
Mike Mead or Anne Powell.

### ● Software Manager — Sussex — to £11K

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of contracts, meeting technical cost and time targets and be  
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will be reporting to you, therefore previous project manager  
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Mike Mead.

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Brian Harris.

### ● RPGII Analyst Programmers up to £10,000 — St Albans

A medium size consultancy specialising in marketing RPGII  
application packages and providing consultancy services on IBM  
GSD equipment, needs a number of experienced analyst pro-  
grammers to work on projects both in-house and on-site. Appli-  
cants should have a knowledge of IBM hardware preferably S.34.  
Brian Harris.

### ● Information Analyst — Middlesex — £10K

This is an excellent opportunity for candidates well versed in  
systems analysis and design who are interested in the technical  
aspects of systems software and wish to move into a junior  
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advanced data centre.  
Karen Rizzello.

### London/Paris — Project Leader — £10K

A major international trading and shipping company are seeking  
someone with experience in systems analysis who will ideally  
have worked with on-line minis using a FORTRAN type language  
and DB techniques to develop a shipping crew system. Future  
prospects are excellent.  
Karen Rizzello.

To apply for any of these positions, please telephone Brian Harris or Karen Rizzello on 01-242 9356.

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We are responsible for the UK manufacture of Glaxo pharmaceuticals and  
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The Company is engaged in the implementation of a large network of modern  
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An opportunity has arisen for a Senior Analyst/Programmer to be based at our  
main factory which is situated in the Northfordshire area. The successful candidate  
will be responsible for the design and development of the on-line systems and  
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Major Company benefits include a generous pension scheme, profit sharing,  
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Please apply for an application form to: Mrs. N. M. Moore, Senior Personnel  
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The Polytechnic  
of North London

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D.P. on Microcomputers

The Polytechnic of North London is a leading centre for the study of computing and information technology. We are looking for a programmer/analyst to join our team of experts in the design and development of microcomputer systems. The successful candidate will be responsible for the design and development of microcomputer systems and will be given a significant role in the implementation of a major junior position becoming available in the near future.

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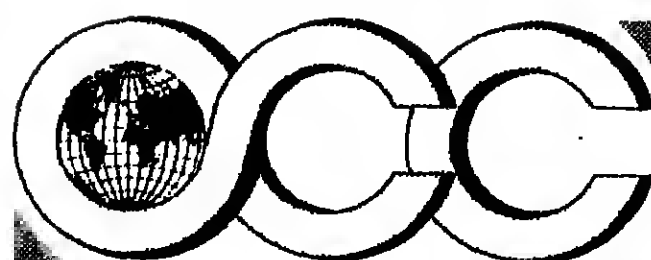
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The Computer Manager reports to the Assistant Managing Director of a local organisation which is part of a substantial group operating throughout the UK.

The Manager will take responsibility for a new mini computer which is to be installed to handle the accounting and management information requirements. Initially standard systems will be used, but new applications will be developed in the future. In addition, the person appointed will be responsible for the operation of computer controlled production systems in the specialised areas of the client's work. The Manager will draw on various support services within the group initially and will recruit a small team of computer specialists later.

Candidates, ideally graduate calibre, will have a strong commercial background with experience of COBOL; real time mini systems; analysis; design implementation and project management.

There are excellent prospects within the group and full training on new systems and technology will be given. A good relocation package is offered.

To apply for this position please ring Neville John on Nantwich (0270) 627206 or write to him at the address given above.

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For further information about the jobs listed, RING NOW. We'll treat your enquiry as completely confidential, tell you all you need to know about location, working conditions etc. and answer any other queries you may have.

### NORTH Programmers c.£280.

Location: Yorkshire.  
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# OPPORTUNITIES IN HOLLAND

PEOPLE who choose or are sent by their company to live and work abroad, find that their new surroundings take some time getting used to. However, the Dutch are used to meeting foreigners, and most of them know one or more foreign language, especially English.

The influx of overseas business to Holland has brought many people from abroad to live there. By and large they have settled down quite happily, and much has been done to make them and their families feel at home.

It is worth looking into the background of the country so as to be a little wiser before going into those lucrative jobs. Holland, otherwise known as the Netherlands, is a small country, but with a population of over 14 million. The population density is the highest in the world. About 8,500,000 people live in Randstad Holland — the western part of the country, where three main cities are situated: Amsterdam, the capital, a seaport and international financial centre; Rotterdam, the largest port in the world (Europe and Marseilles); and The Hague, the seat of the government and the International Court. The Randstad also takes in Hilversum, Haarlem, Leyden, Delft, Gouda and Utrecht, forming one vast tract of urban concentration.

One of the most important aspects of the world-

## Go Dutch...for the really good life!

be worker in Holland from Britain is that it is part of the EEC, so there is no difficulty with work or residency permits.

The economy since the end of the Second World War has been characterised by more or less continuous expansion. In the period 1958-1971 alone, real national income doubled. Economic policy aims to produce goods in such volume and of such quality that exports, with revenue from service industries and capital transactions, can balance imports.

The main industries are metal manufacturing, electrical, electronic, mechanical and aeronautical engineering, non-ferrous metals, food, drink, tobacco, oil and chemicals. Data processing personnel can therefore find themselves engaged on just as wide-ranging applications, including production control, order entry, financial and general commercial projects.

In addition, these industries are by and large located

### by Val Halliwell

IT'S a good life in Holland — and it can be really good, says Val Halliwell, managing director of Victoria Appointments, the Manchester-based computer personnel recruitment company.

Holland, says Miss Halliwell, has the rich chandeliered tradition of the country's 17th Century Golden Age, side by side with buildings to rival the best in modern architecture and facilities, displaying wealth, prosperity and progress at every turn.

Dutch DP installations work to high standards, and she reports that working environments are thoughtfully designed, affording a pleasant working atmosphere.



dominated by IBM, which has a considerable share of the installations.

As in Britain, there is a shortage of skilled DP professionals, the present emphasis being on programmers with fairly general and varied backgrounds, followed by operators.

The DP industry is well represented with software houses, bureaux and manufacturers all vying for business. In addition to a wide range of users, therefore, programmers can expect to be engaged on anything from clearing up backlogs of work caused by staff shortages, conversions to new machines, to development of new software for manufacturers, all of which requires a high level of competence, responsibility and reliability for which British DP technicians are recognised as among the best in the world.

A number of conversions to new ranges now in the pipeline will undoubtedly create great opportunities over the next year or so, in

being on the mainland of Europe, the rest of Europe (including South of France and sunny Spain) is more easily accessible.

Let us now look at the employment prospects for the would-be DP employee in Holland: There are about 1,800 mainframe installations in the Netherlands with a growing interest in the mini and microprocessor area, although at present the market is largely

Another point is that,

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## Quadrant Computer Services Ltd.

Aspley House, Aspley Road, Altham, Lancs. WA14 2DB

## Career opportunities in Holland

BSO/Automation Technology, a major Dutch software house is looking for professionals with a background in technical, scientific or systems software or hardware to join a growing specialist

group. We are looking for people seeking a long-term career in a software and systems house environment rather than a short stay abroad. We need:

**Systems designers**  
to £ 18k  
plus car and expenses

Experience in the design of real-time or control systems based on mini or micro computers. 5 years experience in Automation and a BSc or equivalent are minimum requirements. Knowledge of Assembler is essential. Experience with any of PDP 11, DG Nova or Philips 800 an advantage.

**Analysis**  
to £ 15k  
plus car and expenses

Experience in the development and installation of real-time or control systems based on mini or micro computers. Ability to talk to hardware engineers is important. 3 years experience in Automation and a BSc or equivalent, preferably in computer science or electronics, are minimum requirements. Experience of PDP 11, DG Nova or Philips 800 would be an advantage. Knowledge of Fortran or Basic and Assembler is necessary.

**Programmers**  
to £ 13k  
plus car and expenses

Experience in programming real-time and control systems in Assembler for mini or micro computers. Good design and construction are vital. A minimum of 2 years experience and a BSc are required as is programming experience in Assembler. Experience of PDP 11, DG Nova, Philips 800 or Intel 8080 would be an advantage.

**Microprocessor development engineer**  
to £ 15k  
plus car and expenses

Experience in the development of microprocessor based industrial products or systems with good knowledge of hardware or interfacing problems. 5 years in computing or electronics, ideally with Intel 8080/8085 or Zilog 80 experience. Knowledge of Assembler and at least one high level language is necessary.

The company offers tax free expenses, assistance with medical insurance and a company car covering private use at no cost to the employee. A relocation allowance up to £ 1500 depending on family status plus transportation to Holland will be provided. Other excellent fringe benefits and almost 5 weeks' vacation. Career opportunities to consultant or project management level are available in a growing company. The company is currently busy on a number of different projects using various hardware, including micro.

Applicants to these unique opportunities are requested to send their detailed resume, preferably with photograph, to BSO/Automation Technology. Interviews are scheduled to be held in the U.K. during August 1980.

Mail to: BSO/Automation Technology bv,  
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Phone: 010 - 3130946746



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| GERMANY     | Honeywell IDS/TDS Analyst/Programmer  |
| GERMANY     | IBM Operator DOS/OS   |
| ITALY       | IBM Operator DOS/OS   |
| FRANCE      | 10 x CICS Cobol Prog. Some French req.                                      |
| FRANCE      | Total Systems Prog. Some French   |
| FRANCE      | Prime Project Leader. French must   |
| FRANCE      | Prime Prog. French unnecessary  |
| FRANCE      | OS SYSTEMS PROGRAMMERS  |
| FRANCE      | Systems 3/15 CCP Prog. Some French  |
| FRANCE      | PROG. RPG/Assembler/Cobol etc. 2 years' plus. With some French. Any machine |
| FRANCE      | CICS Project Leaders, 5 years' exp. Some French                             |
| FRANCE      | DL1 Programmer. Some French   |
| SWITZERLAND | RPG 11 & Progs. Sys/34 Cobol or Germany a plus                              |
| SWITZERLAND | RL/IMS Programmer. German useful  |
| SWITZERLAND | UNIVAC 1100. Cobol/Programmer. German useful                                |

MANY MORE. There's simply not much room to list them. Don't wait until you're available immediately. Register with us now for jobs in the future. Write or phone (reverse charges).

## EUROPEAN DATA SERVICES

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## OPPORTUNITIES IN HOLLAND

# OVERSEAS VIA I.A.

Industrial Artists has more challenging and rewarding staff positions on offer. Below are a selection of our most urgent requirements:

**ANALYST PROGRAMMERS** with at least three years experience of COBOL on IBM 370, 4300 and 303X Series machines running under OS/VS1, MVS, DOS/VS and DOS/VSE are required to work at a number of client installations. Good commercial applications experience will be looked for. Various locations in The Netherlands.

**IBM 370-303X COBOL PROGRAMMER** with a minimum of four years experience. Must be able to program UTILISING DL1 FACILITIES. The work involves participation in the design and writing of major new systems. Location: The Netherlands.

**4 ICL SYSTEM 10 ASSEMBLER PROGRAMMERS** are required to work at client premises in Germany. A good knowledge of commercial applications will be looked for. Training will be given in the use of "STELLA". German language not essential, but advantageous.

**UNIVAC 90 SERIES COBOL PROGRAMMERS** are required, with a good knowledge of commercial systems to work on client premises. Location: The Netherlands.

**SIEMENS 552000 SERIES SYSTEMS AND APPLICATIONS PROGRAMMERS** are required to work on conversions of various sites in Benelux countries.

**ICL 2900 and 1900 PLAN PROGRAMMERS** are required for large systems development and optimization of existing systems. Knowledge of STANDARD ICL UTILITIES is essential. Location: The Netherlands.

**IBM SYSTEM 34 ANALYST PROGRAMMERS** with RPG II are required at a number of different sites in The Netherlands.

**TEXAS TI 990 PROGRAMMER** with a good knowledge of COBOL and ASSEMBLER. Location: The Netherlands.

**PDP 11 RTL2 CONSULTANT PROGRAMMER** to work in a PROCESS CONTROL environment. Work involves water purification and pumping stations. Knowledge of German advantageous, but not essential. Location: The Netherlands and Switzerland.

**45 DMS/COBOL PROGRAMMERS** to work on ICL 2900 Series hardware are required to provide 'in house' team support on the development of new systems, plus maintenance of existing systems. Applications will include Payroll, Stock Control and Financial Ledgers. Location: Abu Dhabi. An exceptional benefits package is provided including accommodation, etc.

**SYSTEMS PROGRAMMER** required to implement a DL1 database, also to create and develop systems software. Hardware IBM 4300 Series; operating system DOS/VSE. Location: The Netherlands.

**SYSTEMS PROGRAMMER** required to join our client's own permanent staff. Initial task will be to interface DATA 100 and BYCOR terminals to an IBM mainframe. Knowledge of Dutch language essential. Location: The Netherlands.

**UNIVAC V77 COBOL PROGRAMMERS** with a knowledge of VORTEX package are required to work on a variety of commercial applications. Location: The Netherlands.

**UNIVAC 1100 SYSTEMS PROGRAMMER** required with a good knowledge of 1100 Series operating systems.

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## OPPORTUNITIES IN HOLLAND

### Victoria Appointments Limited

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061-236 7319 = 061-236 7417.



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FREEPOST, Manchester M2 8BD.  
Home No. 061-440 8134.  
(24 hour answering service 061-236 7319)

(2128)

## ARE YOU LOOKING FOR A GOOD CONTRACT (OR PERM.) IN HOLLAND! OR WHAT ABOUT GERMANY!

We think we've got what you're looking for... give us a ring, or drop us a line (with C.V.) and we'll see if we can help.

Call Jim Morrison A'dam 258485  
or Eric Nixon A'dam 259664/A'dam 239800  
or write to our London Office at:  
10 Essex House, George Street, Croydon CR0 1PH

(2129)

### IMS DB/DC PROJECT

Holland £20,000 + p.a.

We are looking for a highly motivated and experienced professional to lead a team of consultants in the development of a new IMS DB/DC project. The project involves the design and implementation of a new IMS DB/DC system for a major client. The successful candidate will have a minimum of 5 years experience in IMS DB/DC development and will be responsible for the overall management of the project. The project is based in Holland and the successful candidate will be required to travel to the client's premises in Holland. The project is expected to last for 12 months. The successful candidate will be offered a competitive salary and benefits package. For further information and details, send your CV FREEPOST or telephone Phil Waller now...

**The European**  
370 Specialists

## CONTRACTS

### LONDON (CITY)

BASIC + CODER with DEC exp.  
DOCUMENTOR with knowledge of BASIC  
RPG11 Analysts + Programmers - IBM/ICL

### HANTS

Systems Analyst with Assurance exp.  
Cobol Programmers OS/VF1

### KENT

PL1 Assembler Programmer

### BRUSSELS

Cobol Programmer (Applications) with DEC exp.

### HOLLAND

Systems Programmer IMS DB/DC

Contact: M. Doherty on

01-439 1856

(2131)

data scene 01-439 7871  
24 hour answer phone

### SOFTWARE ENGINEERS WEST GERMANY

International company based in West Germany requires software and hardware engineers to develop computer-based visual-communication and digital telephone systems. Vacancies exist at all levels up to group leader for applicants qualified to degree or equivalent.

Successful applicants will have experience in real-time database applications and the ability to write and implement programs. Excellent salaries and employee benefits are offered together with generous relocation expenses.

Apply in first instance to:

ETP Ltd, 12 Stone End, Wokingham, Berks.  
Tel: 0734-790123

(2130)

### GREATER GLASGOW HEALTH BOARD COMPUTER CENTRE SYSTEMS DESIGNER

£8,285-£7,885 PER ANNUM  
This Board wishes to appoint an experienced Systems Designer who will be required to attend and, where appropriate, supervise the work of systems staff engaged in the creation and maintenance of an ICL 1903T based computer system for financial and administrative applications. Candidates should have around four years' relevant experience and a good educational background for the post which is based at 27 Park Circus, Glasgow.

Applications form and job description may be obtained from Mr. Margaret Orr, Greater Glasgow Health Board, 247 Buchanan Street, Glasgow, G2 3HT, to whom completed forms should be returned not later than Monday, August 11, 1980.

(2131)

### International Flexitime

Covering Europe, from the headquarters of the UK Computer Software House office's network of working, many experience in the industry.

Mr. Peter Tye  
International  
107 St. Andrews  
107 St. Andrews  
107 St. Andrews

### Systems Analysts Programmers Operators

Contract work - the North

We are currently in the process of interviewing men and women with good Systems Analyst, Programmer or Operator experience in a commercial environment. Any background experience would be useful, as would the ability to communicate with external systems consultants developing systems on the client's behalf. Numerous positions are available for staff with relevant experience. Attractive salaries are negotiable.

Those interested in being considered should write to: Minerva Personnel, 81 Poulton Street, Manchester, M1 1PW. Tel: 061-226 7036

John Kilvington, Minerva Computer Personnel, Recruitment Consultants, Minerva House, East Parade, Leeds, LS1 5RX. Tel: 0532-448998

Minerva  
Computer Personnel

PROJECT LEADER  
COBOL PROGRAMMER  
SYSTEMS ANALYST  
SCIENTIFIC PROGRAMMER  
COBOL PROGRAMMER  
SYSTEMS ANALYST  
COBOL PROGRAMMER  
ANALYST/PROG (PL1)  
CHIEF PROGRAMMER  
SYSTEMS ANALYST  
SYSTEMS PROGRAMMER (CICS)  
ANALYST/PROG (COBOL)  
ANALYST/PROG (COBOL)  
SYSTEMS ANALYST  
PROG. + ANALYST

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PERSONNEL

# Top Jobs, Development

## Design, Programming Sales, Marketing What else??????

For over 300 immediate vacancies -  
Phone EMS today

We'll find your perfect career move for you.

### Sales Manager & Sales Consultants Midlands

Turnkey & Franchising 10K min. earnings to 25K potential

EMS currently have a number of interesting vacancies for proven salesmen, with a small but technically experienced unit supporting a growing network of clients throughout the U.K. The centre's primary product is the Honeywell Level 8 series, for which we have proven integrated systems available for most applications, offering unique marketing advantages. Without doubt, the range of Level 8 series products now available with EMS are beyond the investment capability of all but the leading manufacturers.

Our requirement now is for professional, experienced salesmen capable of rapidly penetrating defined markets with available products starting from £20,000 upwards for basic Turnkey systems. Experience of selling to Stockists, Distributors, Manufacturers, Co. Buying and Sales organisations and general commerce is required. Equally we have a need for senior level staff capable of taking territory control and eventually moving towards controlling entire regional teams.

We seek only experienced salesmen capable of selling a minimum of £200,000 worth of systems to a vast potential U.K. market. Our modularised software is currently in process of being converted to other leading manufacturers' new systems offering to enhance our market opportunities during the 1980s. Ability to sell sophisticated products under franchise to other Turnkey Groups or Software Houses would also be of interest. Attractive salaries and commission schemes are available for top salesmen.

Consultant: John Wood - 0782 623666

### Analysts & Progs - Burroughs London

Negotiable salaries

A client dealing with Banking and Foreign Exchange Systems seeks a number of staff with Burroughs 81700 or 1900 Cobol experience in a commercial environment. Any background experience would be useful, as would the ability to communicate with external systems consultants developing systems on the client's behalf. Numerous positions are available for staff with relevant experience. Attractive salaries are negotiable.

Contact: Carol Atkin - 0782 623666

### IBM Systems Engineers London

Ref: 01613400 £8,000 to £12,000

Our clients are seeking a unique combination of skills and will pay attractive salaries to attract the right candidates. Experience of IBM 370's or 434's, Assembler, OS/VS VM and CICS will be essential. The systems engineer will assist in the planning and development of specialised software with the real time system. You will be a Technical Specialist who will design and generate software and carry out some programming. Duties will include the generation and maintenance of software in many other languages. You will evaluate suppliers' software for the client's system recommending enhancements where appropriate. You should have a minimum 8 years' experience of IBM 370's or 434's, Assembler, and at least 2 years' CICS. Some experience of structured programming would be advantageous and good standards experience will be important to ensure accurate working within a disciplined environment. The client is a major IBM user dealing in commodities within the City.

Contact: Carol Atkin - 0782 623666

### IBM Project Controllers and Programming Controllers Merseyside

Ref: 002 110540 £8,000 to £12,000

Candidates should be capable of project planning and project controllers. Project Controllers will control analysis and design, functional testing projects, with regular user contact, from initial conception through to final installation. Education to graduate level is preferable.

Programming Controllers will be experienced in IBM AS/400 Cobol and Assembler, and have proven ability to plan and manage large work loads. Experience of OL1 or IMS is essential. Any experience of multiple or Distributed Processing would be particularly attractive.

The client is a subsidiary of a major U.K. engineering group who have computer control systems through to a full IBM 3033 in the Midlands. Most applications are either existing or in stages of development.

Contact: Carol Atkin - 0782 623666

### URGENT - EMS CONTRACT REQUIREMENTS - £250-£350 p.w.

Southern

Assembler DB Prog. - Kent - 6-12 months  
IBM OS/2 Honeywell Prog. - Level 8/9 - Essex - 6-12 months  
PL1 DB Prog. - Kent - 6-12 months  
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### Project Managers Birmingham

£6,000 upwards + car

We need experienced men managers with good system design capability to join an expanding Turnkey Group based at our Birmingham Data Centre. Ability to co-ordinate team activities and to handle multiple systems shipments, using existing modularised software to reduce development time work content will be desirable.

The major emphasis during the 1980's will be that of rapid shipments from initial enquiries, and staged enhancement to existing software with odd custom-built systems working within a fixed price environment. We are already looking at the introduction of structured programming and many other production aids. Ability to function as a Business Analyst and assist with tender preparations will be advantageous.

All candidates must have undertaken at least 2 years' Cobol programming at some stage during their career. We seek applicants aged from 27 upwards prepared to work in a demanding environment and control teams of up to 6 staff. Travel to client sites is an important function so a driving licence is essential. We offer a modern, informal working environment where promotion based upon results is encouraged for all group staff.

Consultant: John Wood - 0782 623666

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### ICL Analysts & Progs. Hull

£8,800 to £12,000

A large ICL user, currently developing under Osage 2 and DMS-2, has a number of urgent requirements for experienced ICL staff. Candidates must be educated to a minimum A-level and have an ICL Cobol or Fortran programming background. On-line systems experience would be particularly attractive. The client is a well-known and highly successful trading group dealing with U.K. wide systems. Candidates will join a small team of approximately 12 mixed Analysts and Programmers, working on the development of financial and commercial systems. At Hull, staff will also get involved with the development of custom-built production systems and additional technical projects. Opportunities exist equally for later moves into management.

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Contact: Carol Atkin - 0782 623666

### Software Designers & Systems Programmers Middlesex

Ref: 002 110540 £8,000 to £12,000

Our clients, a major Space and Defence Systems Manufacturer, have over 50 urgent vacancies for experienced software engineers to work on real-time and software systems. Positions include Systems Engineers, Diagnostic Engineers and Programmers. Any experience in COBOL would be particularly attractive. We currently seek applicants from staff who have worked in an Aerospace, Defence or Space environment who are seeking the opportunity of joining a progressive British Group. Relocation packages will be provided.

The client is a subsidiary of a major U.K. engineering group who have computer control systems through to a full IBM 3033 in the Midlands. Most applications are either existing or in stages of development.

Contact: Carol Atkin - 0782 623666

### Midlands

ICL 1900 Prog. - George III - 6-12 months  
Assembler DB Prog. - Kent - 6-12 months  
IBM OS/2 Honeywell Prog. - Level 8/9 - Essex - 6-12 months  
PL1 DB Prog. - Kent - 6-12 months  
Assembler - Kent - 6-12 months  
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Assembler - Kent - 6-12 months

Assembler - Kent - 6-12 months

### ICL Systems Designers/ Analysts North Staffs

Good Negotiable Salaries

We urgently seek experienced ICL 1903/4 Systems Designers and Analysts capable of taking design responsibilities for a small software team taking on customised development for a growing range of ICL clients throughout the Midlands and North who are regularly returning for repeat business. All applicants must have a sound working knowledge of 1900s or the 1903 systems and be capable of making an early contribution towards the unit's development. Current clients include Manufacturing, Electrical Goods, Printing Groups, the range of food processing and a variety of other industries.

A good pre-sales personality is essential as regular client contact is involved. We seek a neat and orderly working manner to ensure adherence to group standards. Ability to project forecast and plan is important as most of our work is based upon firm, price quotes, necessitating light and meaningful controls.

The ICL unit is located in a small informal environment in a modern office building with easy access to most Midlands and Northern centres. An excellent client relationship already exists for the unit and individuals capable of enhancing this further our growing relationship. Attractive salaries and fringe benefits can be available depending upon the level of experience and ability offered. Salary will not be an obstacle for the right candidates.

Consultant: Don Watkins - 0782 623666

### Progs. & Analysts - Banking Systems Manchester/Cheshire

£8,800 to £12,000

We currently have a large number of vacancies for experienced computer Analysts and Cobol Progs, to work on major banking systems involving both IBM and Univas hardware. Any on-line experience would be particularly advantageous. Hardware training will be supplied where appropriate. Early interviews are available for all candidates of interest. Please apply directly to application form. Excellent opportunities currently exist.

Contact: Carol Atkin - 0782 623666

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Assembler - Kent - 6-12 months

Assembler - Kent - 6-12 months

Assembler - Kent - 6-12 months

### Senior Software Designers & Progs. Hants, London, Cheshire

Up to £11,000

A major U.K. software group are currently seeking a large number of additional staff to work on a variety of different projects with group development centres. Examples of projects involved are as follows:

1. Initial design of major command projects for the Police requiring Cobol and Algol knowledge using Burroughs hardware. A knowledge of MCP/GENCOS/ICL/OMS-11 would be advantageous.
2. Military and Communications projects requiring a knowledge of POP-11, OG Nove, Fortran, GEC and Const 86. Alternatively Assembler or Minis would be advantageous.
3. Programmers are required to work on pension systems for a major assurance company on an on-line IBM mainframe. The applications have extensive use of database and transaction processing.

Numerous other vacancies exist throughout the U.K. Graduates are preferred.

Contact: Carol Atkin - 0782 623666

### Systems Analysts - Commer- cial Systems North West

£8,800 to £12,000

We have a number of vacancies for experienced systems analysts to join our client support teams building large and complex applications systems under the control and direction of client staff. Candidates with Stock, Accounting and Distribution experience are particularly relevant. Ideally you will be a career minded professional with at least 3 years' systems experience with a previous 1/2 years' Cobol programming background and be capable of working with a minimum of management experience.

All candidates should currently be earning at least £8,000. EMS are prepared to offer attractive salaries and the free travelling expenses. We offer varied work assignments on long-term contracts, and excellent earnings prospects. Scope also exists for travel or appointments within other divisions of the group. Please apply directly to application form.

Contact: Carol Atkin - 0782 623666

### Software Designers & Systems Programmers Middlesex

Ref: 002 110540 £8,000 to £12,000

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Assembler - Kent - 6-12 months



## Sales and Marketing Professionals

Modular Computer Services is a European leader in the supply of computer systems to the communications and industrial marketplaces.

We are a young dynamic company with a rapidly expanding marketing and sales organisation and as part of this expansion we are looking for Technical Marketing Analysts and Sales Engineers to join our existing teams in Wokingham and Coventry.

### Technical Marketing Analysts c £11,000 + Company Car

Suitable candidates will have a technical background on minis and will probably have held senior positions in projects implementing real time systems in industrial or communications applications. The right people will be enthusiastic committed individuals capable of providing our sales force with comprehensive support. This role may suit software specialists with both assembler experience and proficiency in a high level technical language who are looking for the challenge of a demanding pre-sales environment.

### Sales Engineers c £16,000 + Company Car

We are looking for Sales Engineers with a proven background of successful selling within a minicomputer environment. They will preferably have a knowledge of communications or process control markets and the kind of drive and determination that will enable them to achieve commission of £6-£8k above targets met. We expect to attract aggressive individuals capable of making a significant contribution to a sales organisation and who are looking to take on increased responsibilities in the future.

Company benefits are excellent and include a non-contributory pension scheme, free Life Assurance and free BUPA.

For further information ring Sue Burden on Wokingham 780711 or write to Modcomp, Molly Millars Lane, Wokingham, Berks.

(2088)  
**MODCOMP**

### IBM EXPERIENCE

MIDLANDS £7,000-£9,500 PLUS

Our client, a long established Midlands consultancy wish to recruit further professional staff at all levels.

The opportunities merit strong consideration, as the organisation can offer a real career challenge, allowing individuals scope and variety. The company is of long standing, stable and carefully managed. They are embarking on a well planned expansion, particularly on the B100 and 4300 ranges and so seek additional staff with IBM experience.

The various roles include programming, principally in PL/I and COBOL, systems design, project management and consultancy, working with experienced colleagues, and providing opportunities for personal advancement.

Experience of CICS, PL/I, IMS, QMS or QJMS would be of particular interest, but is not essential.

The company has a friendly personal approach to clients and staff alike, and has generated an active social life. Benefits such as a monthly salary review and bonus, pension and sickness schemes, 5 weeks holiday, motor allowance and expenses are attractive.

If you can offer IBM experience, and would like a confidential discussion, contact Mike Heslop ref CW 280.

**COMPUTER PERSONNEL  
CONSULTANTS**  
18th Floor, The Rotunda  
Birmingham B2 4PA  
021-632 8848

POLYTECHNIC OF THE  
SOUTH BANK  
Borough Road, London  
SE1 0AA

DEPARTMENT OF  
MATHEMATICAL SCIENCES  
& COMPUTING

**SENIOR LECTURER /  
LECTURER II  
in COMPUTER SCIENCE**  
(Ref. X.10)

Required to teach on a range of undergraduate, diploma and professional courses in Computing. Applicants should offer specialism in at least one of the following subjects:

Programming (Theory & Methodology)  
Systems Programming  
Programming in Structured Languages

Salary: (Subject to formal approval and review from 1st April, 1980) (including of linear London Allowance)  
Senior Lecturer £7,800-£9,848  
Lecturer II £5,480-£8,403

Further particulars and application forms from:  
The Staffing Office, Polytechnic of the South Bank, Borough Road, London SE1 0AA. (2089)

**SALES EXECUTIVE  
MICRO COMPUTERS**

Equipment Sales Manager with knowledge of micro-computer and software products. Must be able to sell and demonstrate to business customers. Must have a minimum of 2 years experience in sales of micro-computer products. Must be able to work on commission basis. Salary £6,000-£8,000 per annum. Please send CV and references to: EASAMS, 18th Floor, The Rotunda, Birmingham B2 4PA. (2090)

**ANALYST/  
PROGRAMMER  
BASIC - RSTS**  
£6,000-£8,000 City of London. A minimum of two years RSTS experience is required. The successful candidate will be part of a small team working on computer systems applications. (2100)

01-623 6941  
**TELEPHONE**

## Magnetic Media Software Librarian

Easams is one of the foremost systems companies in Europe. We are engaged in researching and commissioning a wide variety of demanding systems and software applications, based on a new CDC Installation.

For this interesting position we are looking for a man or woman with at least 2 years' experience of magnetic media librarianship and handling software issues for operational use.

Working day-shift hours you will be concerned with both tape and discs, and should be able to operate cleaners as required.

Please telephone Linda Palmer on Camberley 63377 extn. 4557, reversing the charges, or write giving details to: Easams Limited, Lyon Way, Fimley Road, Camberley, Surrey. Please quote reference CW1.

**EASAMS**  
A DEC-Marcov Electronics Company

## Sales Engineers

CAD/CAM  
EUROPEAN & UK AREAS

## Marketing SUPPORT and RESEARCH PERSONNEL

positions based in  
South of England

\*Earnings Packages commensurate  
with experience

**SEN**

Specialist Computer Recruitment Ltd

We are a highly successful Group of Companies, creating, manufacturing and marketing CAD/CAM systems. Our record to date is impressive, our product range innovative and expanding and our export achievements outstanding. (70% of our products are exported). Expansion, in the U.K. and world markets has opened up a number of opportunities for people with relevant experience and commitment to join a stable, though dynamic Company whose products are exciting, well accepted and strongly supported.

### Sales Engineers

At least 2 years sales experience, a competent knowledge of CAD/CAM and the ability to identify applications is essential. Your negotiation skills should be well developed as must your ability to deal with people at all levels, understanding the effect of computerisation upon their companies and departments. For the EUROPEAN position fluency in French or German would be preferable. The earnings potential is good, as is the prospect of advancement.

### Marketing Positions

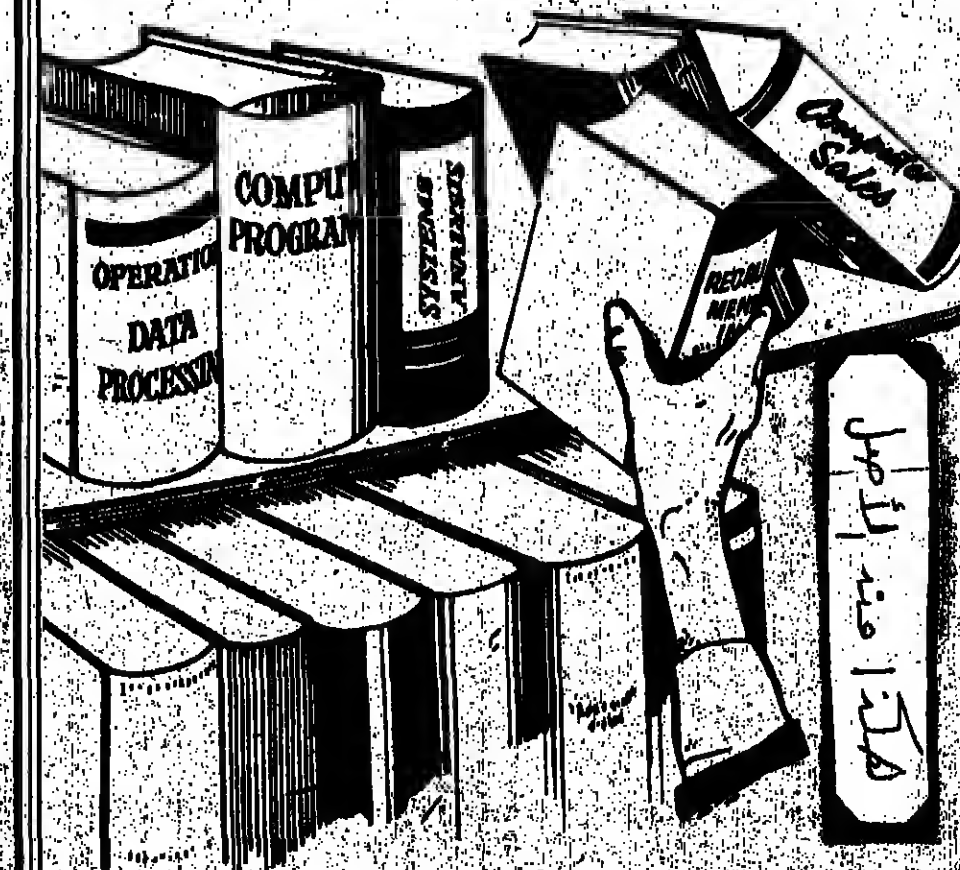
To enhance our penetration we wish to identify market support and market research people. The SUPPORT position offers the chosen applicant the opportunity to carry out a pure marketing role from the product inception through to launch. We are introducing a new product in 1981 and such a person is of vital importance. Knowledge of CAD/CAM would be advantageous as would knowledge of the electronics industry. The MARKET RESEARCH opportunity is open to people who have recently graduated and have a strong electronics or technical background where they will be responsible for collating information prior to dissemination. The successful applicants will be working with a number of people within the sales division and so it is imperative that they have the ability to communicate effectively in a fast moving and challenging environment.

All the positions offer genuine opportunities for advancement within the Company's diverse structure.

For an immediate and confidential interview contact our Advising Consultant, Simon Lever, On 01-935 0671 (24 hour answering service) Or 021-420 1574 (evenings and weekends) Your application will be treated in total confidence. If you wish please write to me.

London 01-935 0671 3 Mandevilla Place, Wigmore Street, London W1M 5LB  
Birmingham 021-238 3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY  
Manchester 061-833 0427 Blackfriars House, The Parsonage, Manchester M3 2JA  
Brussels 010 322-640 7151/71 Avenue Louise 327, Boite 4, 1050 Bruxelles

## SELECT A DIFFERENT OPPORTUNITY . . . IN COMPUTER RECRUITMENT . . . and earn £7,000 - £12,000+



Recruitment consultancy provides a high degree of interest and allows you to build upon the knowledge of the computer industry gathered in your career to date.

You meet many different people - client management in both the D.P. and personnel areas, often with serious and long standing staff shortages.

Applicants seeking a new position, but often worried and confused by the choices open in a widely differing range of companies - manufacturers, bureaux, software houses, users with a wide variety of machines and software.

As you gain knowledge both through training and experience you become the consultant able to help. You understand the market and learn about the attraction and selection of applicants. Your skills will be in making a suitable match which satisfies applicants and clients.

In joining Capp Associates you come to a market leader in the recruitment industry with a reputation and customer base widely respected by both our clients and our competitors. You will work closely with our Directors in expanding and consolidating our client list and you will be well rewarded for your efforts.

Naturally we expect effort and results. Our recruitment consultants work hard and are expected to provide a high level of service. They need to be the right sort of people with the will to succeed.

We are willing to invest in you if we consider you can do the job . . . all you have to do is invest a little effort to discover whether this is the time for you to change into recruitment consultancy.

Please telephone (24 hour answering service) or write to apply. Quote Ref. CW140-89.

**CAPP  
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Computer and Professional Personnel Consultants  
AMP House, Dingwall Road, CROYDON CR9 8XA



0702-615551/2 **TASK FORCE** 0782-410217/8

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**WORKING WITH TASK FORCE**

If you have good relevant experience you too could join TASK FORCE. Our solution to staff shortages is to provide the best deal for freelancers and therefore provide the best support for our clients. With TASK FORCE you will work as part of a friendly professional team, we will give you more cash in your pocket, more work and more benefits. Contract or permanent, you have the option — this is how it works.

**ON A CONTACT BASIS**

—We will pay you very competitive rates, give you regular work, training and security.

—If required we will set you up as a limited company. This gives you complete control of your tax payments and means you could pay much less.

—A free counselling service by Qualified Accountants is provided for your personal and company tax problems.

—We will solve your administration headaches, your company set up, book-keeping, invoicing, accounts and tax returns will be done for you by professionals as a free service.

—You benefit on registration for VAT (we of course administer the accounts), on lease car arrangements, on sickness insurance, and on pension plans.

—Holiday payments, contract bonuses and retainer deals can be negotiated.

**ON A PERMANENT STAFF BASIS**

Salary negotiable circa 10K + company car, training, security and all company benefits.

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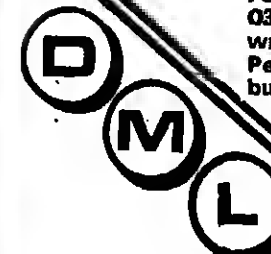
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Our client requires high calibre professionals to work on a variety of real-time projects using mini computers, as well as become involved with micro based packages and development.

A strong background in mini systems using a high level language is essential as is the ability to communicate with clients and technical staff at all levels. Some micro development experience is highly desirable.

This is a progressive forward looking software house offering excellent career prospects.

Contact: Brian Ponties

### Communications Technicians

**South London**  
c. £9,000

We are currently recruiting experienced communication staff for our client who has just upgraded from TOL 1900 series to a 2960, which will eventually be configured to run as a 3mb dual VME/B machine, encompassing a large communications network with associated equipment.

A minimum of 12 months experience is essential, covering areas of design and cataloguing, fault diagnosis and implementation of communications software with exposure to VME/B support work in fields other than communications. This is an excellent opportunity to gain experience within a substantial communications environment, utilising the latest technology.

Contact: Janet Chilvers

### Analyst/Programmers

**London EC2**  
up to £8,500

A very successful international organisation wishes to recruit several ANALYST/PROGRAMMERS to work in small teams to develop commercial on-line applications on an HP 3000.

Candidates should have three years programming experience together with some involvement in the design of systems. A background of minicomputers is obviously desirable but not mandatory as training will be given where appropriate. Interesting and friendly environment.

Contact: Jim Baker

### Programmer/Analyst

**City**  
£7,500

Our client, a medium sized insurance organisation, are in the process of installing their own mini computer, and need an experienced person to play a major role in the development of systems. Initially working very closely with the software house who are supplying the turnkey system, also liaising with the bureau which the company is currently using.

A minimum of two years COBOL, preferably from a small machine environment, some programme design experience is essential.

The appointee will have every opportunity to develop within the company, plus all benefits associated with a financial organisation.

Contact: Janet Chilvers

### COBOL Programmer

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Our client, a leading international computer services organisation, wishes to appoint a Programmer to one of their product support groups.

Applicants should have at least two years in commercial applications using COBOL and possibly APL on IBM 370's or 31 machines. Ability to deal with clients and solve user problems is essential.

Contact: Jim Baker

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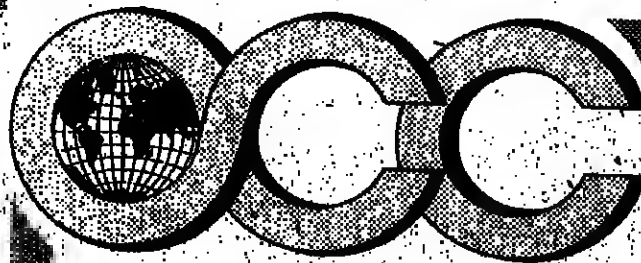
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A computer manufacturer in Herts wishes to recruit the above personnel. The systems programmer should be used to rapid problem determination and solution. For both positions an IBM and/or mini background with some experience would be ideal. U.K. and possibly European travel will be part of your duties. Mike Mead or Anne Powell.

### Software Manager - Sussex - to £11K

A leading supplier of mini systems, based in Sussex is looking for a software manager with a sound knowledge of real-time system concepts. You will be responsible for the profitable implementation of contracts, meeting technical cost and time targets and be expected to advise on system suitability. A team of some 10 people will be reporting to you, therefore previous project manager experience is required together with administrative ability. Mike Mead.

### Production Control Unit Manager - Reading - to £4.2K

Applicants should be able to work independently and have extensive experience of computerised production systems with more than one machine. Involvement in analysis and design experience would be a distinct advantage as would knowledge of stock control material planning techniques. Mike Mead.

### RPGII Analyst Programmers up to £10,000 - St Albans

A medium size consultancy specialising in marketing RPGII application packages and providing consultancy services on IBM GSD equipment, needs a number of experienced analyst programmers to work on projects both in-house and on-site. Applicants should have a knowledge of IBM hardware preferably S/34. Brian Harris.

### Information Analyst - Middlesex - £10K

This is an excellent opportunity for candidates well versed in systems analysis and design who are interested in the technical aspects of systems software and wish to move into a junior management role. Candidates would be involved in developing a centralised control function for all data in a busy technological advanced data centre. Karen Rizzello.

### London/Paris - Project Leader - £10K

A major international trading and shipping company are seeking someone with experience in systems analysis who will ideally have worked with on-line minis using a FORTRAN type language and DB techniques to develop a shipping crew system. Future prospects are excellent. Karen Rizzello.

To apply for any of these positions, please telephone Brian Harris or Karen Rizzello on 01-242 9356.

TELETYPE

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Programmer and Analysts. Programmers sought by International Software Group to work on FAX systems in France (near German border). At least 4 years' software development experience necessary, with microelectronics (or similar) background. Reasonable French required.

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(207)

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Systems Programmer, Programmer, Designer with knowledge of COBOL, Data base and CICS or TPMS. Wanted to work in various UK locations (London, Midlands and North) by specialist consultancy. IBM experience of particular interest, an in-house switching or network design.

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Defence-oriented Systems House requires Programmers with experience in some or all of the following disciplines: Mathematical Modelling, Real-time applications on Minis and Mainframes. Knowledge of Database with languages Algol, Fortran, Assembler equally a definite bonus.

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## OUTSTANDING OPPORTUNITY SCOTLAND

Our client, a leading and prestigious financial concern with head offices in Edinburgh, requires a number of Analyst/Programmers as part of further expansion.

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### JUNIOR ANALYST/PROGRAMMERS

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Candidates should have proven ability in COBOL and be able to show one year's potential or experience.

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For further information and to arrange location interview, telephone David Smith on 031-226 9999 (031-226 9974, 24-hr. service) or write, enclosing CV, to: Mr. G. J. Larsen, Computer Personnel Services, 11 Charlotte Square, Edinburgh EH2 4DL.

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## D.P. Manager

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In advance of the introduction of a new computer in the future, our client is looking for a D.P. Manager to take over the responsibility of the D.P. Manager. The successful candidate will have a background of at least 5 years in D.P. preferably in a business environment with knowledge of COBOL programming. Please send your CV to: Mr. G. J. Larsen, Computer Personnel Services, 11 Charlotte Square, Edinburgh EH2 4DL.

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## Analyst-Programmers

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The positions are based in Riyadh, U.S. 2 year contract status contracts will be offered, including free furnished accommodation, car, medical cover and 20 days paid U.K. leave every six months.

Telephone for an application form, quoting reference number, 02, in London, Newbury, Reading, Southampton, London, Dagenham, The Mall, London, W5 3FS. Telephone No. 01-579 0294.

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Either write with full career details, or phone for further information, to: Barbara Hawkins, Personnel Department, Data Logic Limited, Westway House, 320 Ruslip Road East, Greenford, Middlesex UB6 9BH. Telephone: 01-578 9111. Or phone: 01-235 1535 (24 hours) for further details and an application form.



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## data scene

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## THE SALES BIT

## Persuasion is always better than force

ARE you sitting comfortably? Then I'll begin.

One day the North Wind and the Sun were arguing about which was the stronger. They were unable to agree and decided to devise a means whereby their argument could be settled.

Down in the world below, a man was walking along with a sack held firmly over his shoulders to keep out the cold of a less than tolerable day. The North Wind decided that here was a perfect vehicle for proving his superiority. He therefore stated that he could remove the sack from the man's back more quickly and effectively than the Sun.

The man was shocked by the sudden arrival of a fierce and bitter wind that almost blew him to the ground, but he quickly adjusted to the unexpected assault, grasped the sack tightly, braced himself firmly and walked determinedly into the unrelenting blast. The harder the wind blew, the tighter he held the sack. The fiercer the assault, the more determined he became. Eventually the North Wind realised he was making no progress, at all, and agreed to let the Sun have a go.

The man was as surprised by the sudden change in the weather as he had been by the arrival of the wind. The sky began to clear, the temperature rose, and very soon the man began to ease his grip on the sack and soon felt so warm and relaxed that he took off the sack, lay down under a tree and went to sleep.

I am sure this Aesop fable has appeared somewhere in the childhood of most readers, but its point would be just as relevant if it were to appear in the middle of a training course for salesmen or managers.

Whether the situation is a difficult negotiation, the admonishment of a delinquent subordinate, the settlement of a dispute, or a person-to-person disagreement, one can always rely on aggressive tactics to

strengthen the resolve of the protagonist and oblige him to take the opposite route in that being thrust upon him.

As a matter of principle, most people will give less under duress than they will in circumstances of consideration and friendly persuasion.

One of the greatest apparent justifications for the aggressive/autocratic stance is the belief that right is on one's side. It seldom is, in the absolute sense, and the very existence of a dispute is usually a function of one's opponent having an equally strong faith in his own case.

It's amazing how many people put on blinkers in order to handle a difficult negotiation and find it impossible to view the situation from the other's standpoint. This is as applicable to man-management as it is to selling.

Certainly one uses the term "sales aggression", but this should be a "bridled" force closely related to enthusiasm which embraces the whole gamut of selling activity rather than person-to-person communications which typically thrive on resolve, tempered with consideration and sensitivity.

Back to Aesop: The moral is not simply a matter of force versus persuasion; it is also about identifying what people are seeking, what they need, what they want, what will make them happy — not inflicting upon them what one wishes them to have.

The man in the story wanted to be warm, not cold, and no manner of argument about the warmth of a post-douche glow was going to persuade him otherwise.

### TRADER

Trader welcomes comments on his column and is happy to consider readers' problems in marketing and selling.

## CALLS FOR PAPERS

### Comnet 81 in Budapest

PAPERS are invited by October 1 for Comnet 81, a conference that will look at computer networks from the user's point of view. It is to be held next May in Budapest, Hungary. Sponsored by the International Federation for Information Processing and UNESCO, this conference aims to identify the problems associated with using computers remotely, and to suggest solutions.

Contributions are invited on topics including network performance, data crossing national boundaries, new services such as electronic mail and videotext, network operators' experience and the needs of bodies such as the International Standards Organisation and the Conference of European Post and Telegraph Administrations.

Comnet 81 is a sequel to a similar event in Budapest in 1977. Members of the programme committee include Dr Donald Davies of the National Physical Laboratory, Louis Pouzin of the Institut de Recherche en Informatique et d'Automatique, and Dr Fitz

### Telecoms software

PAPERS are invited for the fourth International Conference on Software Engineering for Telecommunications, to be held at Warwick University in July next year. Synopses should be sent to the organisers, the Institution of Electrical Engineers, Savoy Place, London, WC2B 4BP, by September 8.

### Puzzle Answer

THE 16-move solution is: 2-3-B-7-6-4-1-2-3-B-4-8-7-B-5-4.



